

UNCLASSIFIED

AD NUMBER

AD916557

NEW LIMITATION CHANGE

TO

**Approved for public release, distribution
unlimited**

FROM

**Distribution authorized to U.S. Gov't.
agencies and their contractors; Specific
Authority; 04 FEB 1974. Other requests
shall be referred to Commander, Naval
Ocean Research and Development Activity,
Attn: Lib., National Space Technology
Laboratories, Bay St. Louis, MS 39529.**

AUTHORITY

**CNO [N772] ltr N772A/6U875630, 20 Jan
2006, ONR ltr, 31 Jan 2006**

THIS PAGE IS UNCLASSIFIED

UNCLASSIFIED

AD NUMBER

AD916557

NEW LIMITATION CHANGE

TO

Distribution authorized to U.S. Gov't. agencies and their contractors; Specific Authority; 04 FEB 1974. Other requests shall be referred to Commander, Naval Ocean Research and Development Activity, Attn: Lib., National Space Technology Laboratories, Bay St. Louis, MS 39529.

FROM

Distribution authorized to U.S. Gov't. agencies only; Test and Evaluation; 04 FEB 1974. Other requests shall be referred to Director, Long Range Acoustic Propagation Project, Office of Naval Research, Attn: Code 102-OS, Arlington, VA, 22217.

AUTHORITY

ONR, per DTIC Form 55

THIS PAGE IS UNCLASSIFIED

✓ *✓*
JG
MC REPORT 011
Volume 14

AD 916557

ACOUSTIC ENVIRONMENTAL SCENARIOS AND PREDICTIONS FOR ASW

VOLUME 14
AREA 5, WINTER
PREDICTIONS FOR PASSIVE SONAR

October 1972

AD No. —
DDG FILE COPY
000

LONG RANGE ACOUSTIC PROPAGATION PROJECT



OCEAN SCIENCE PROGRAM
MAURY CENTER FOR OCEAN SCIENCE
Department of the Navy
Washington, D.C.

Distribution limited to U.S. Gov't. Agencies only
Test and Evaluation; 4 FEB 1974 Other requests
for this document must be referred to

This document contains neither recommendations nor conclusions of the Navy. It has been reviewed and approved for public release by the
Director, Long Range Acoustic Propagation Project (ONR Code 102-OS).

ACCESSION	DATE
178	White Scotish <input type="checkbox"/>
179	Self Selection <input checked="" type="checkbox"/>
180	<input type="checkbox"/>
181	<input type="checkbox"/>
182	
183	
184	
185	
186	
187	
188	
189	
190	
191	
192	
193	
194	
195	
196	
197	
198	
199	
200	
201	
202	
203	
204	
205	
206	
207	
208	
209	
210	
211	
212	
213	
214	
215	
216	
217	
218	
219	
220	
221	
222	
223	
224	
225	
226	
227	
228	
229	
230	
231	
232	
233	
234	
235	
236	
237	
238	
239	
240	
241	
242	
243	
244	
245	
246	
247	
248	
249	
250	
251	
252	
253	
254	
255	
256	
257	
258	
259	
260	
261	
262	
263	
264	
265	
266	
267	
268	
269	
270	
271	
272	
273	
274	
275	
276	
277	
278	
279	
280	
281	
282	
283	
284	
285	
286	
287	
288	
289	
290	
291	
292	
293	
294	
295	
296	
297	
298	
299	
300	
301	
302	
303	
304	
305	
306	
307	
308	
309	
310	
311	
312	
313	
314	
315	
316	
317	
318	
319	
320	
321	
322	
323	
324	
325	
326	
327	
328	
329	
330	
331	
332	
333	
334	
335	
336	
337	
338	
339	
340	
341	
342	
343	
344	
345	
346	
347	
348	
349	
350	
351	
352	
353	
354	
355	
356	
357	
358	
359	
360	
361	
362	
363	
364	
365	
366	
367	
368	
369	
370	
371	
372	
373	
374	
375	
376	
377	
378	
379	
380	
381	
382	
383	
384	
385	
386	
387	
388	
389	
390	
391	
392	
393	
394	
395	
396	
397	
398	
399	
400	
401	
402	
403	
404	
405	
406	
407	
408	
409	
410	
411	
412	
413	
414	
415	
416	
417	
418	
419	
420	
421	
422	
423	
424	
425	
426	
427	
428	
429	
430	
431	
432	
433	
434	
435	
436	
437	
438	
439	
440	
441	
442	
443	
444	
445	
446	
447	
448	
449	
450	
451	
452	
453	
454	
455	
456	
457	
458	
459	
460	
461	
462	
463	
464	
465	
466	
467	
468	
469	
470	
471	
472	
473	
474	
475	
476	
477	
478	
479	
480	
481	
482	
483	
484	
485	
486	
487	
488	
489	
490	
491	
492	
493	
494	
495	
496	
497	
498	
499	
500	
501	
502	
503	
504	
505	
506	
507	
508	
509	
510	
511	
512	
513	
514	
515	
516	
517	
518	
519	
520	
521	
522	
523	
524	
525	
526	
527	
528	
529	
530	
531	
532	
533	
534	
535	
536	
537	
538	
539	
540	
541	
542	
543	
544	
545	
546	
547	
548	
549	
550	
551	
552	
553	
554	
555	
556	
557	
558	
559	
560	
561	
562	
563	
564	
565	
566	
567	
568	
569	
570	
571	
572	
573	
574	
575	
576	
577	
578	
579	
580	
581	
582	
583	
584	
585	
586	
587	
588	
589	
590	
591	
592	
593	
594	
595	
596	
597	
598	
599	
600	
601	
602	
603	
604	
605	
606	
607	
608	
609	
610	
611	
612	
613	
614	
615	
616	
617	
618	
619	
620	
621	
622	
623	
624	
625	
626	
627	
628	
629	
630	
631	
632	
633	
634	
635	
636	
637	
638	
639	
640	
641	
642	
643	
644	
645	
646	
647	
648	
649	
650	
651	
652	
653	
654	
655	
656	
657	
658	
659	
660	
661	
662	
663	
664	
665	
666	
667	
668	
669	
670	
671	
672	
673	
674	
675	
676	
677	
678	
679	
680	
681	
682	
683	
684	
685	
686	
687	
688	
689	
690	
691	
692	
693	
694	
695	
696	
697	
698	
699	
700	
701	
702	
703	
704	
705	
706	
707	
708	
709	
710	
711	
712	
713	
714	
715	
716	
717	
718	
719	
720	
721	
722	
723	
724	
725	
726	
727	
728	
729	
730	
731	
732	
733	
734	
735	
736	
737	
738	
739	
740	
741	
742	
743	
744	
745	
746	
747	
748	
749	
750	
751	
752	
753	
754	
755	
756	
757	
758	
759	
760	
761	
762	
763	
764	
765	
766	
767	
768	
769	
770	
771	
772	
773	
774	
775	
776	
777	
778	
779	
780	
781	
782	
783	
784	
785	
786	
787	
788	
789	
790	
791	
792	
793	
794	
795	
796	
797	
798	
799	
800	
801	
802	
803	
804	
805	
806	
807	
808	
809	
810	
811	
812	
813	
814	
815	
816	
817	
818	
819	
820	
821	
822	
823	
824	
825	
826	
827	
828	
829	
830	
831	
832	
833	
834	
835	
836	
837	
838	
839	
840	
841	
842	
843	
844	
845	
846	
847	
848	
849	
850	
851	
852	
853	
854	
855	
856	
857	
858	
859	
860	
861	
862	
863	
864	
865	
866	
867	
868	
869	
870	
871	
872	
873	
874	
875	
876	
877	
878	
879	
880	
881	
882	
883	
884	
885	
886	
887	
888	
889	
890	
891	
892	
893	
894	
895	
896	
897	
898	
899	
900	
901	

11 Oct '72

12/183 p.

14 M C - 011-101-14

6
ACOUSTIC ENVIRONMENTAL SCENARIOS AND PREDICTIONS
FOR ASW.

Volume XIV. Area 5 WINTER
PREDICTIONS FOR PASSIVE SONAR.

Vol - 010 101-101-14

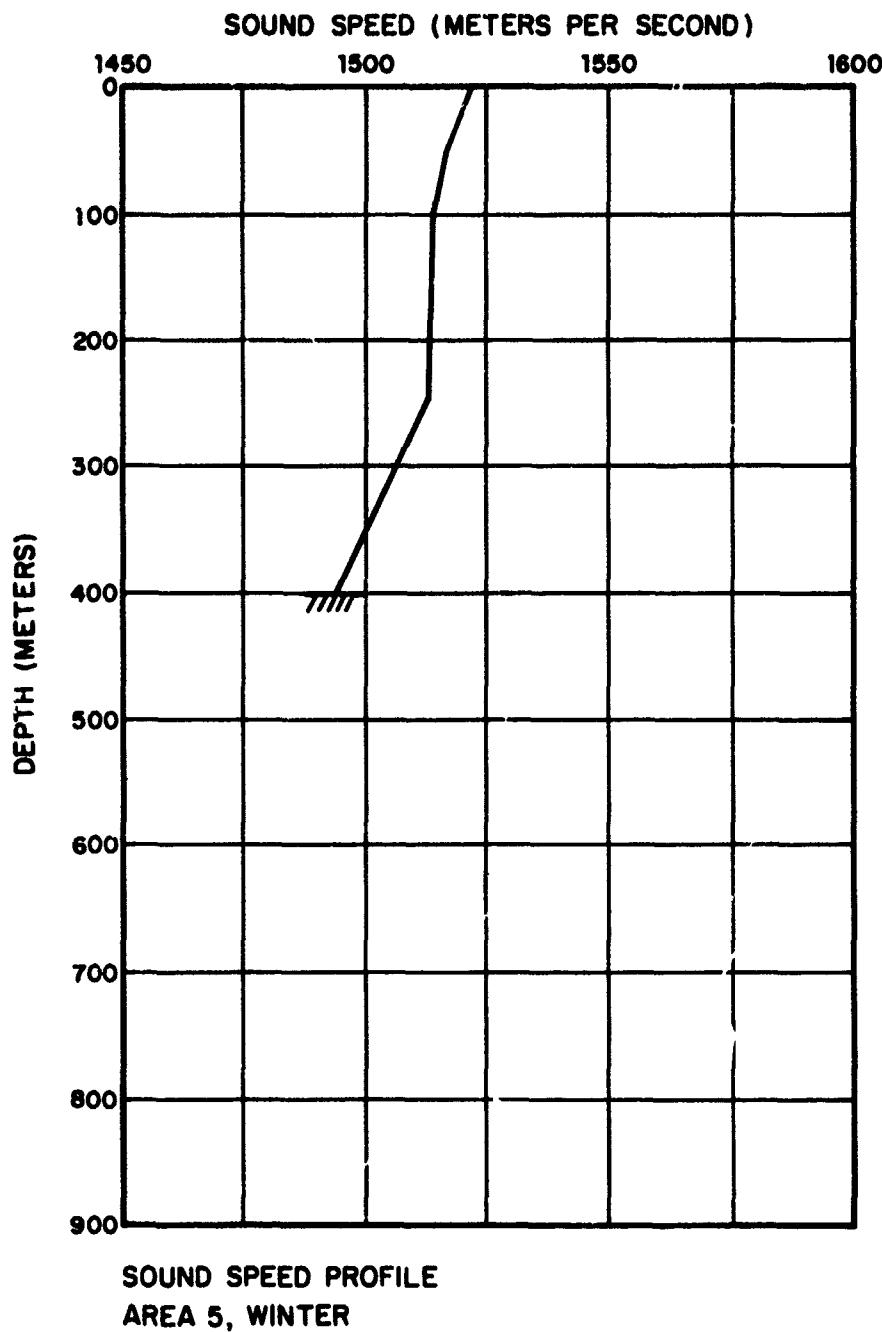
Vol - 10 AD 916 5566

Vol 14

Refer to Volume I of this report for an explanation of the
plot format and descriptions of models and ocean areas.

404 409

att



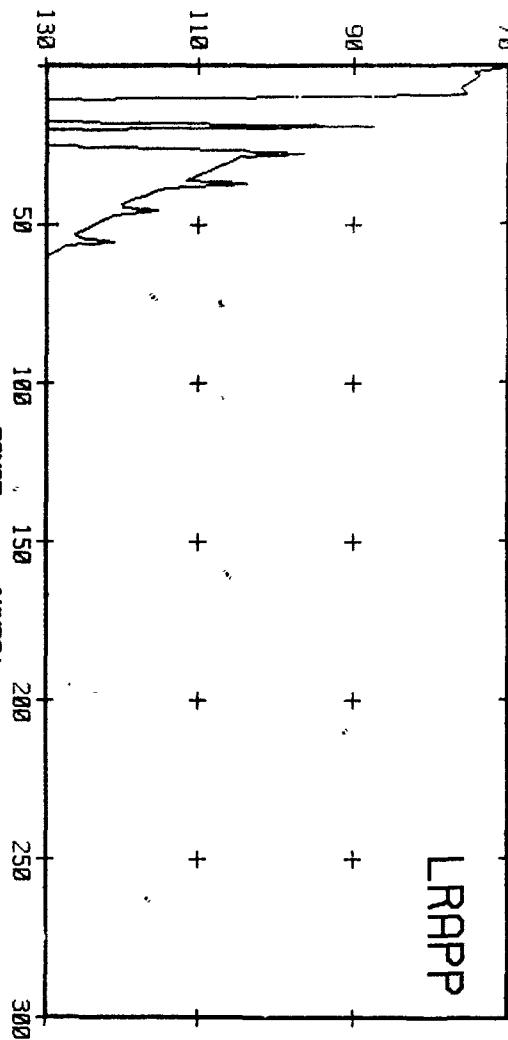
AREA 5 WINTER

S 28 R 60 F 10

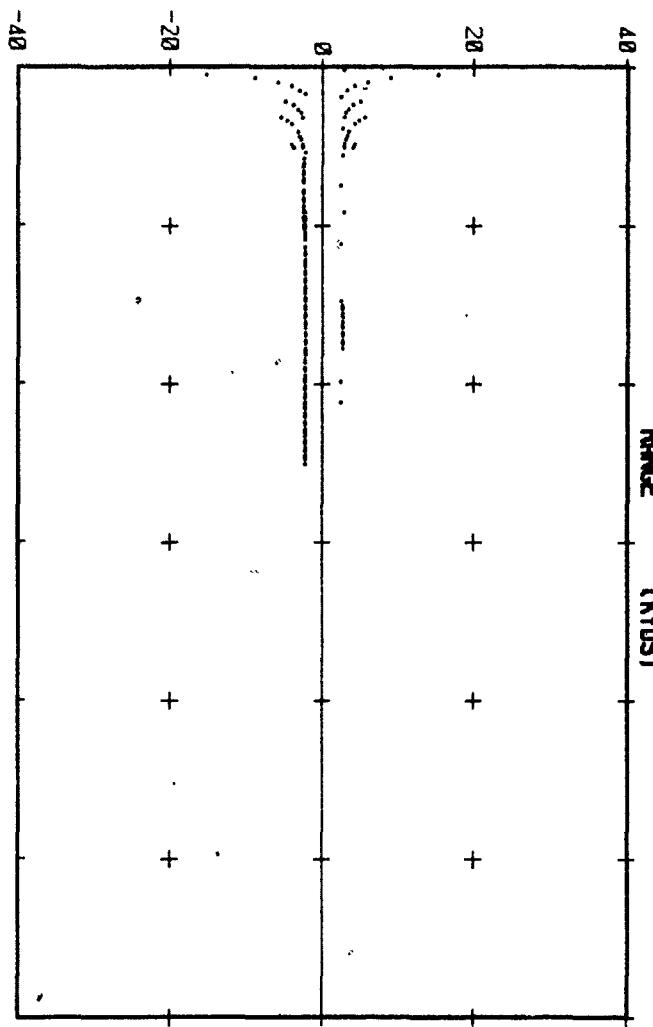
1450 M/S 1500 1550

LRAPP

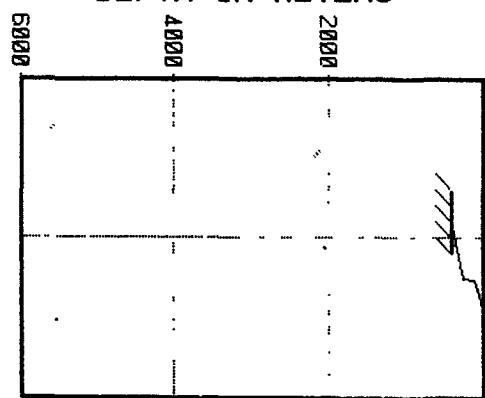
DB LOSS



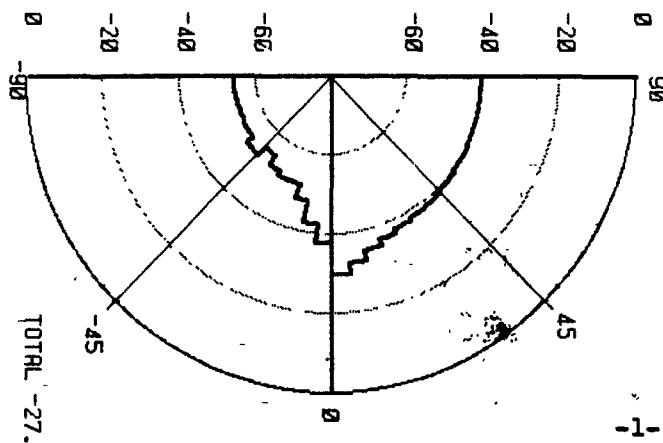
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -27.1 DB

70

AREA 5 WINTER

S 50 R 60 F 10

1450 M/S 1500 1550

LRAPP

DB LOSS

90
100
110

2000

4000

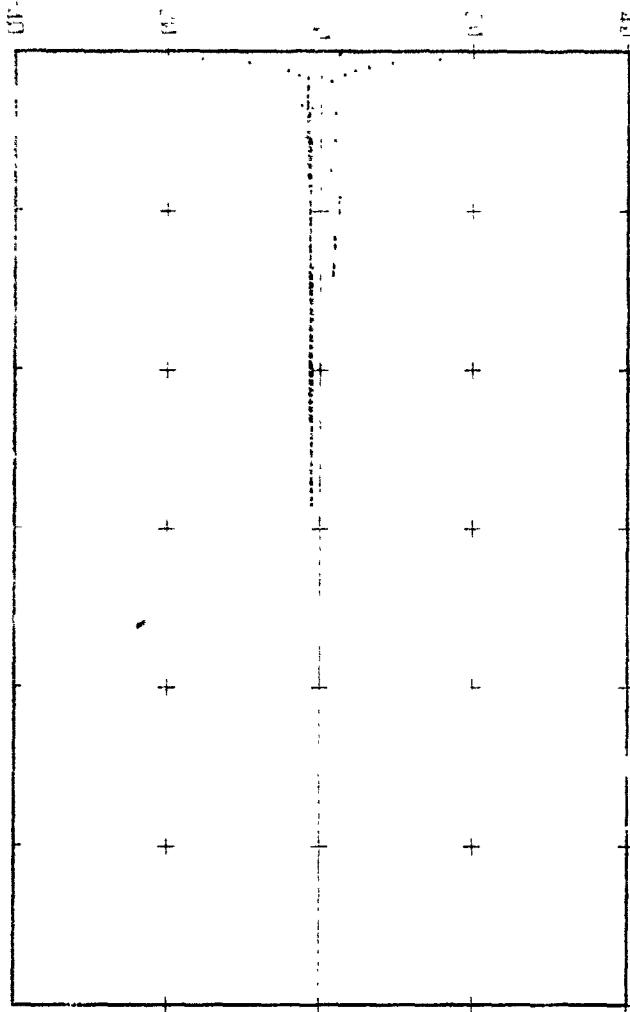
6000

8000

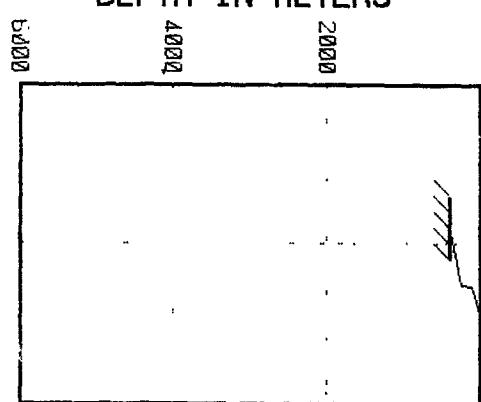
130
-50
-100
-150
-200
-250
-300

RANGE (KYES)

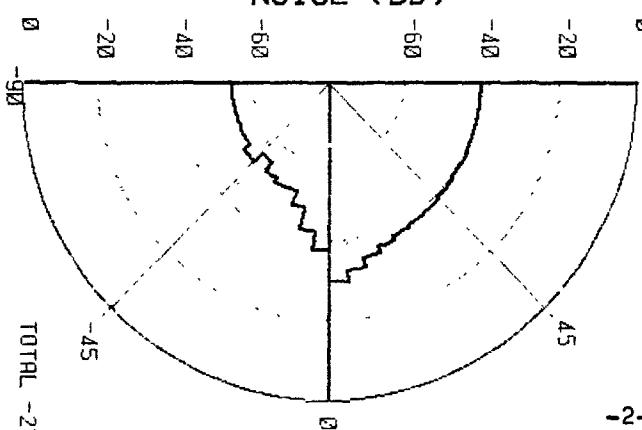
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



70

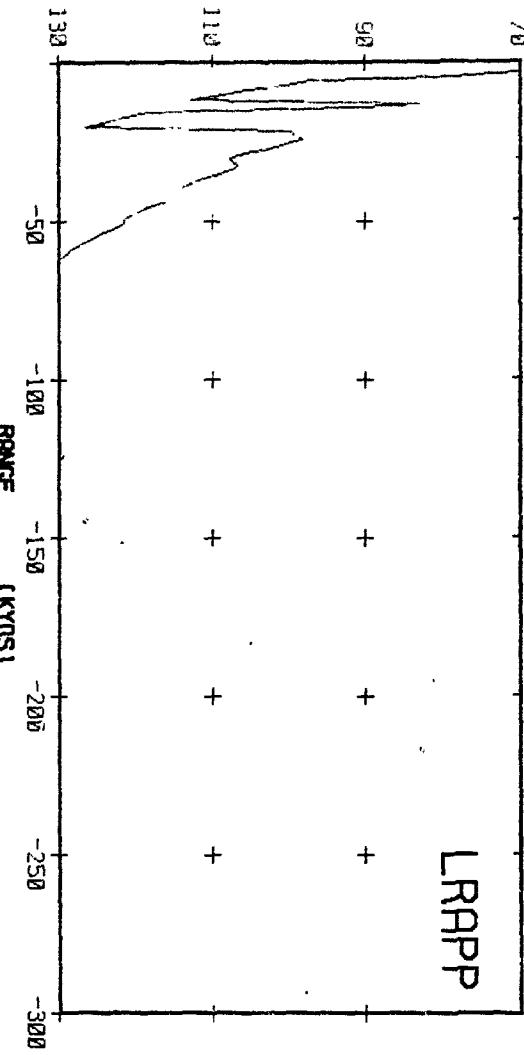
AREA 5 WINTER

S 1020 R 89 F 10

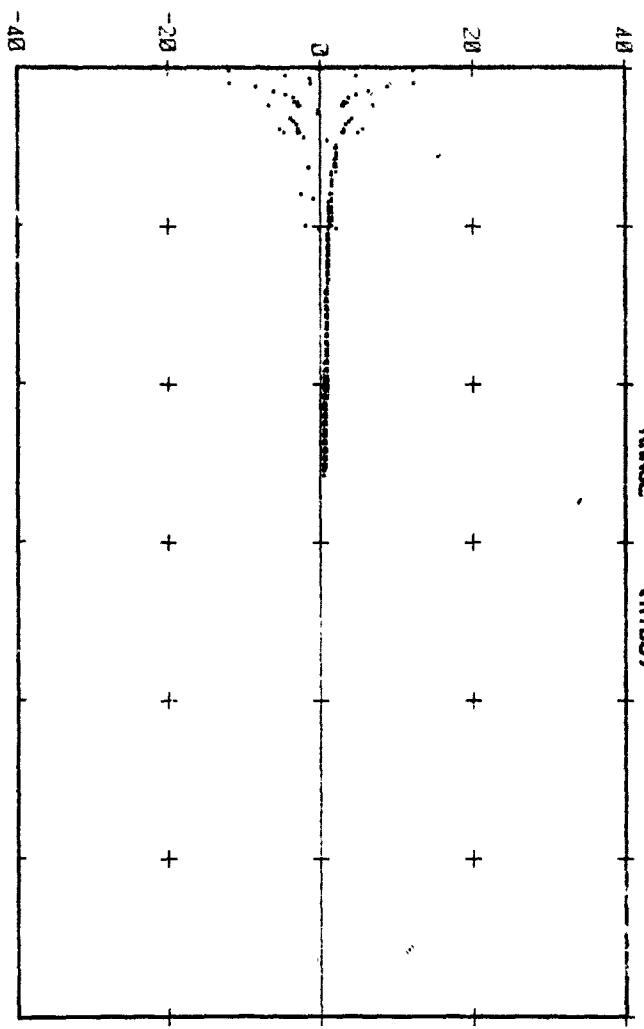
1450 M/S 1500 1550

LRAPP

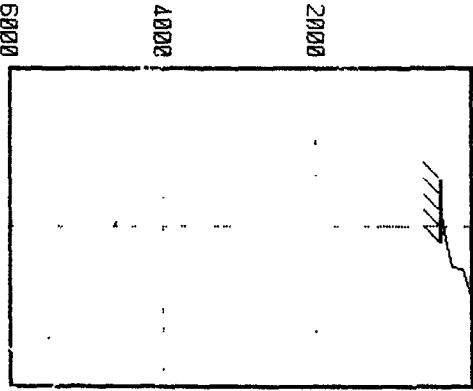
DB LOSS



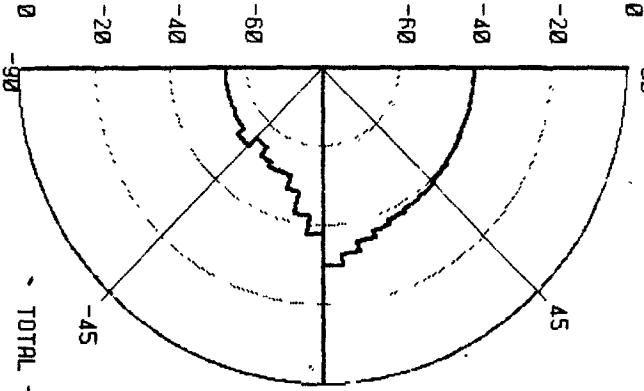
ARRIVAL ANGLE



DEPTH IN METERS

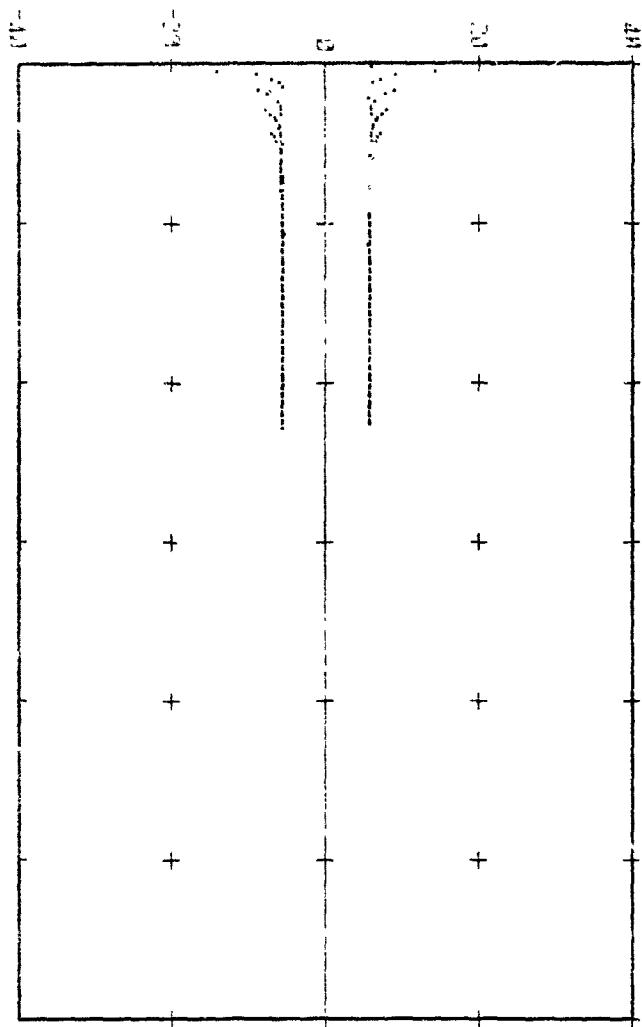


NOISE (DB)

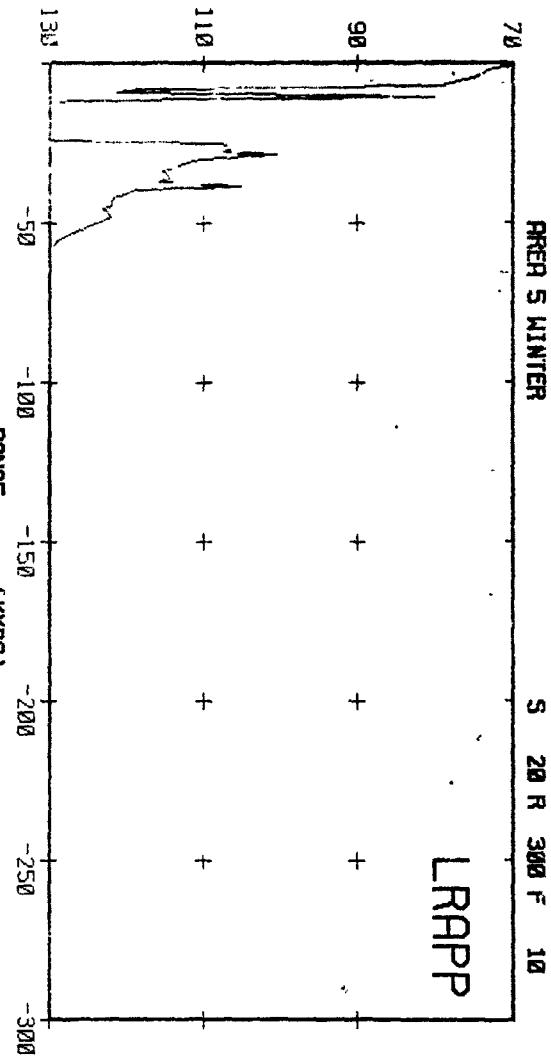


TOTAL -27.1 DB

ARRIVAL ANGLE



DB LOSS



LRAPP

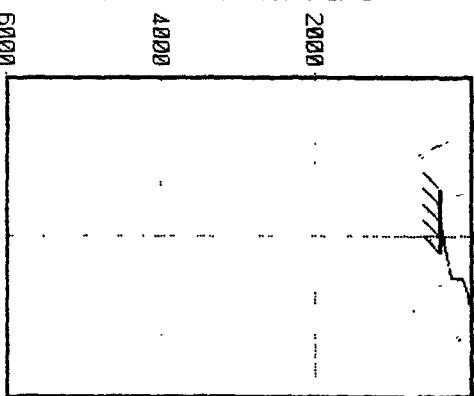
70

AREA 5 WINTER

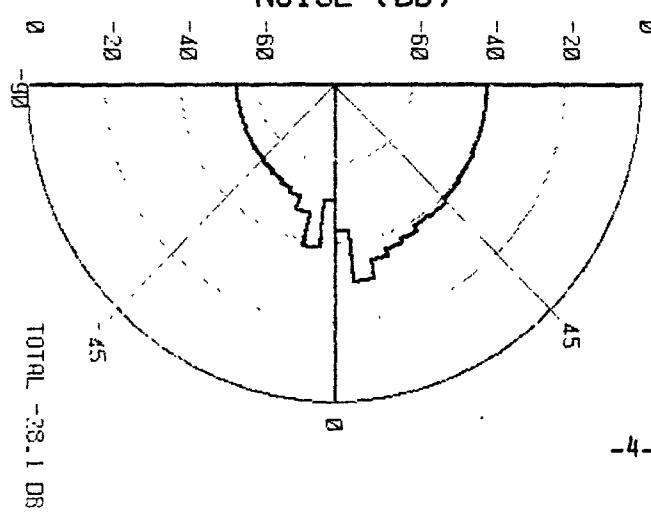
S 20 R 300 F 10

1450 N/S 1500 1550

DEPTH IN METERS



NOISE (DB)



-4-

-41

70

AREA 5 WINTER

S 50 R 300 F 10

1450 M/S 1500 1550

LRAPP

DB LOSS

90

110

130

40

+ + + + +

-

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

130
110
90
40
-50 -100 -150 -200 -250 -300

RANGE (KTS)

DEPTH IN METERS

2000

4000

6000

8000

10000

12000

14000

16000

18000

20000

22000

24000

26000

28000

30000

32000

34000

0

45

90

-5

-45

-90

-135

-180

-225

-270

-315

-360

-405

-450

-495

-540

-585

ARRIVAL ANGLE

20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
-200
-220
-240
-260
-280
-300
-320
-340
-360
-380
-400
-420
-440
-460
-480
-500
-520
-540
-560
-580
-600
-620
-640
-660
-680
-700
-720
-740
-760
-780
-800
-820
-840
-860
-880
-900
-920
-940
-960
-980
-1000
-1020
-1040
-1060
-1080
-1100
-1120
-1140
-1160
-1180
-1200
-1220
-1240
-1260
-1280
-1300
-1320
-1340
-1360
-1380
-1400
-1420
-1440
-1460
-1480
-1500
-1520
-1540
-1560
-1580
-1600
-1620
-1640
-1660
-1680
-1700
-1720
-1740
-1760
-1780
-1800
-1820
-1840
-1860
-1880
-1900
-1920
-1940
-1960
-1980
-2000
-2020
-2040
-2060
-2080
-2100
-2120
-2140
-2160
-2180
-2200
-2220
-2240
-2260
-2280
-2300
-2320
-2340
-2360
-2380
-2400
-2420
-2440
-2460
-2480
-2500
-2520
-2540
-2560
-2580
-2600
-2620
-2640
-2660
-2680
-2700
-2720
-2740
-2760
-2780
-2800
-2820
-2840
-2860
-2880
-2900
-2920
-2940
-2960
-2980
-3000
-3020
-3040
-3060
-3080
-3100
-3120
-3140
-3160
-3180
-3200
-3220
-3240
-3260
-3280
-3300
-3320
-3340
-3360
-3380
-3400
-3420
-3440
-3460
-3480
-3500
-3520
-3540
-3560
-3580
-3600
-3620
-3640
-3660
-3680
-3700
-3720
-3740
-3760
-3780
-3800
-3820
-3840
-3860
-3880
-3900
-3920
-3940
-3960
-3980
-4000
-4020
-4040
-4060
-4080
-4100
-4120
-4140
-4160
-4180
-4200
-4220
-4240
-4260
-4280
-4300
-4320
-4340
-4360
-4380
-4400
-4420
-4440
-4460
-4480
-4500
-4520
-4540
-4560
-4580
-4600
-4620
-4640
-4660
-4680
-4700
-4720
-4740
-4760
-4780
-4800
-4820
-4840
-4860
-4880
-4900
-4920
-4940
-4960
-4980
-5000
-5020
-5040
-5060
-5080
-5100
-5120
-5140
-5160
-5180
-5200
-5220
-5240
-5260
-5280
-5300
-5320
-5340
-5360
-5380
-5400
-5420
-5440
-5460
-5480
-5500
-5520
-5540
-5560
-5580
-5600
-5620
-5640
-5660
-5680
-5700
-5720
-5740
-5760
-5780
-5800
-5820
-5840
-5860
-5880
-5900
-5920
-5940
-5960
-5980
-6000
-6020
-6040
-6060
-6080
-6100
-6120
-6140
-6160
-6180
-6200
-6220
-6240
-6260
-6280
-6300
-6320
-6340
-6360
-6380
-6400
-6420
-6440
-6460
-6480
-6500
-6520
-6540
-6560
-6580
-6600
-6620
-6640
-6660
-6680
-6700
-6720
-6740
-6760
-6780
-6800
-6820
-6840
-6860
-6880
-6900
-6920
-6940
-6960
-6980
-7000
-7020
-7040
-7060
-7080
-7100
-7120
-7140
-7160
-7180
-7200
-7220
-7240
-7260
-7280
-7300
-7320
-7340
-7360
-7380
-7400
-7420
-7440
-7460
-7480
-7500
-7520
-7540
-7560
-7580
-7600
-7620
-7640
-7660
-7680
-7700
-7720
-7740
-7760
-7780
-7800
-7820
-7840
-7860
-7880
-7900
-7920
-7940
-7960
-7980
-8000
-8020
-8040
-8060
-8080
-8100
-8120
-8140
-8160
-8180
-8200
-8220
-8240
-8260
-8280
-8300
-8320
-8340
-8360
-8380
-8400
-8420
-8440
-8460
-8480
-8500
-8520
-8540
-8560
-8580
-8600
-8620
-8640
-8660
-8680
-8700
-8720
-8740
-8760
-8780
-8800
-8820
-8840
-8860
-8880
-8900
-8920
-8940
-8960
-8980
-9000
-9020
-9040
-9060
-9080
-9100
-9120
-9140
-9160
-9180
-9200
-9220
-9240
-9260
-9280
-9300
-9320
-9340
-9360
-9380
-9400
-9420
-9440
-9460
-9480
-9500
-9520
-9540
-9560
-9580
-9600
-9620
-9640
-9660
-9680
-9700
-9720
-9740
-9760
-9780
-9800
-9820
-9840
-9860
-9880
-9900
-9920
-9940
-9960
-9980
-10000

NOISE (DB)

-5

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

70

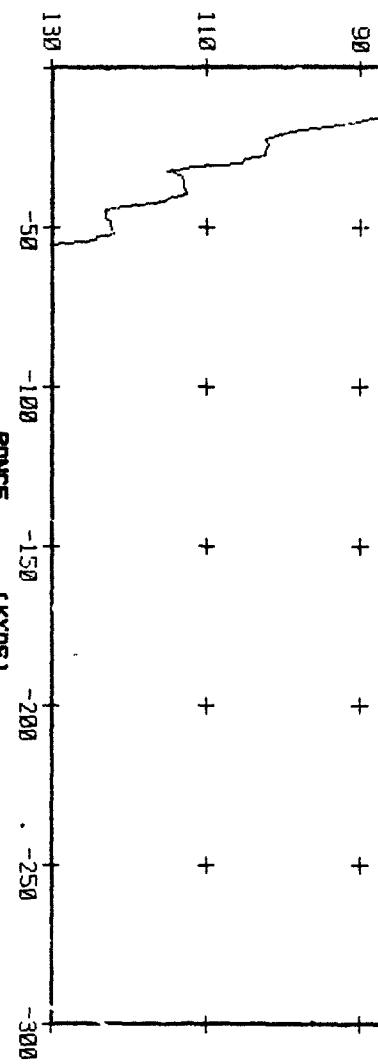
AREA 5 WINTER

S 1020 R 300 F 10

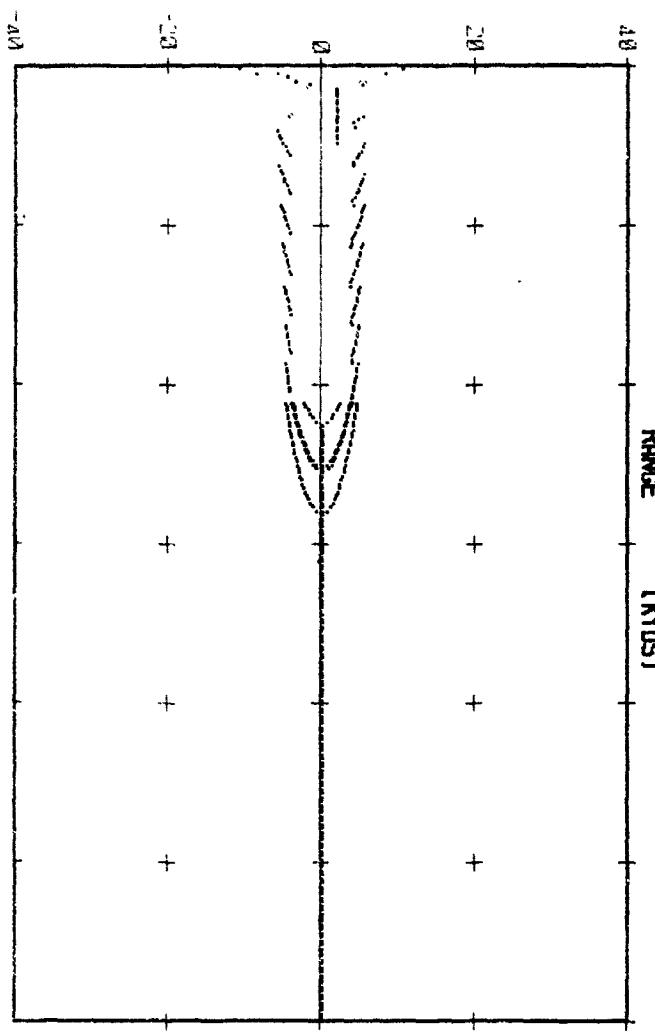
1450 M/S 1500 1550

LRAPP

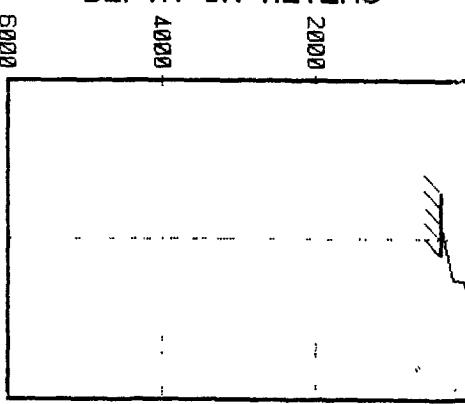
DB LOSS



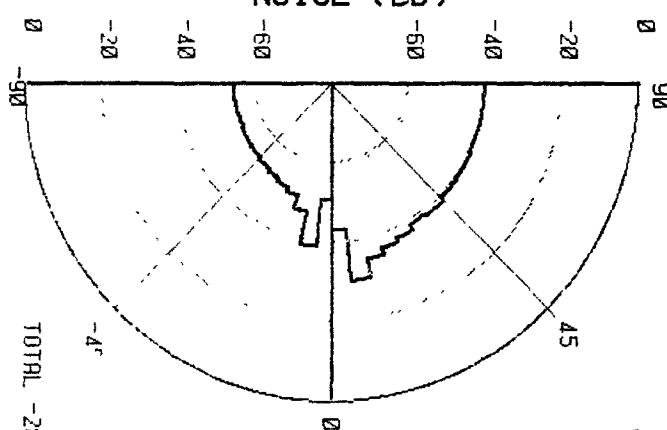
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



70

ARR 5 WINTER

S

LRAAPP

1450 M/S

1500

1550

DB LOSS

50

+

+

+

+

+

+

130

-

-

-

-

-

-

-

40

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-

-</

70

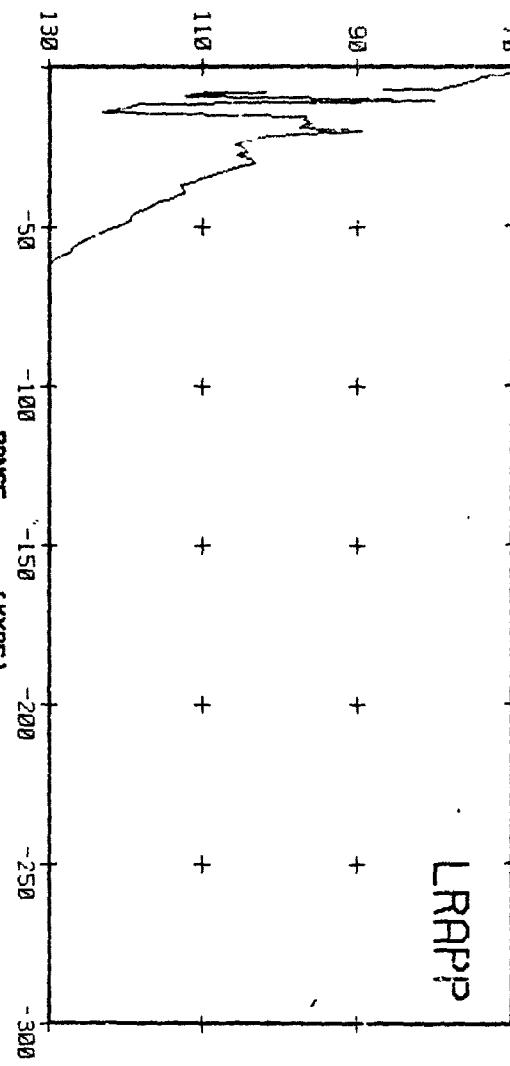
AREA 5 WINTER

S 50' R 328 F 10

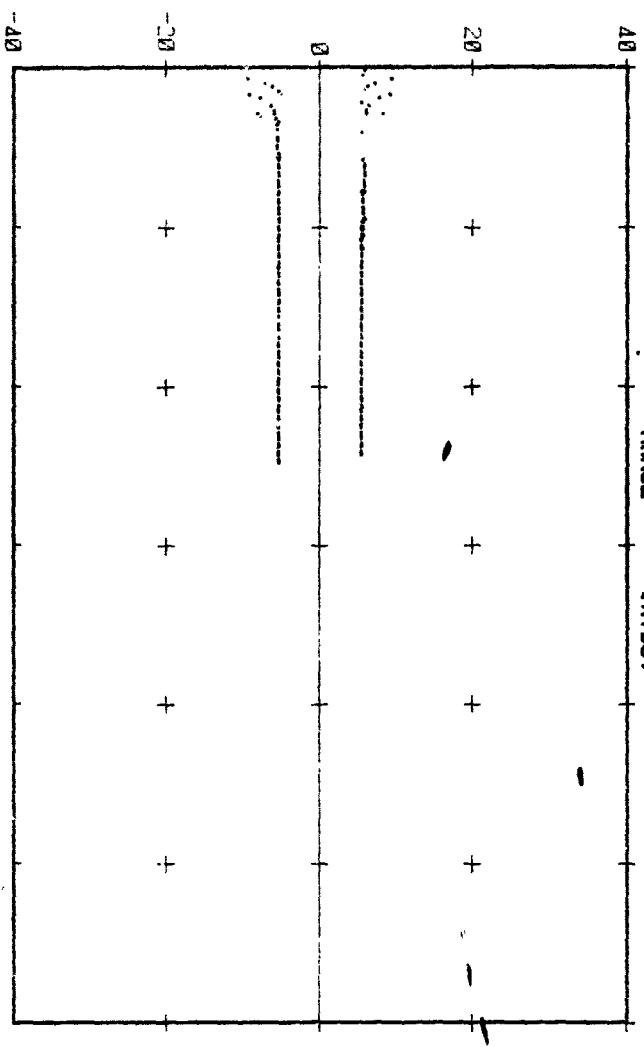
1450 M/S 1500 1550

LRAFP

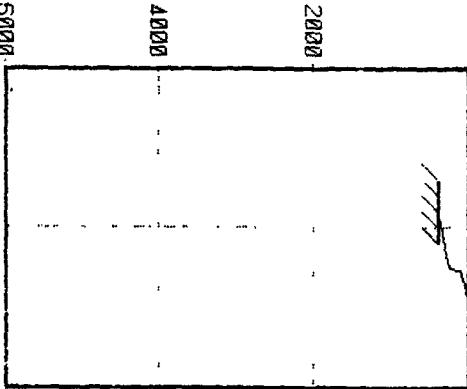
DB LOSS



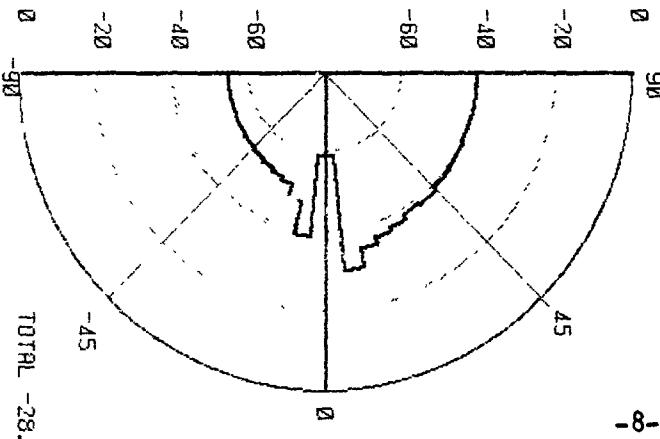
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -28.1 dB

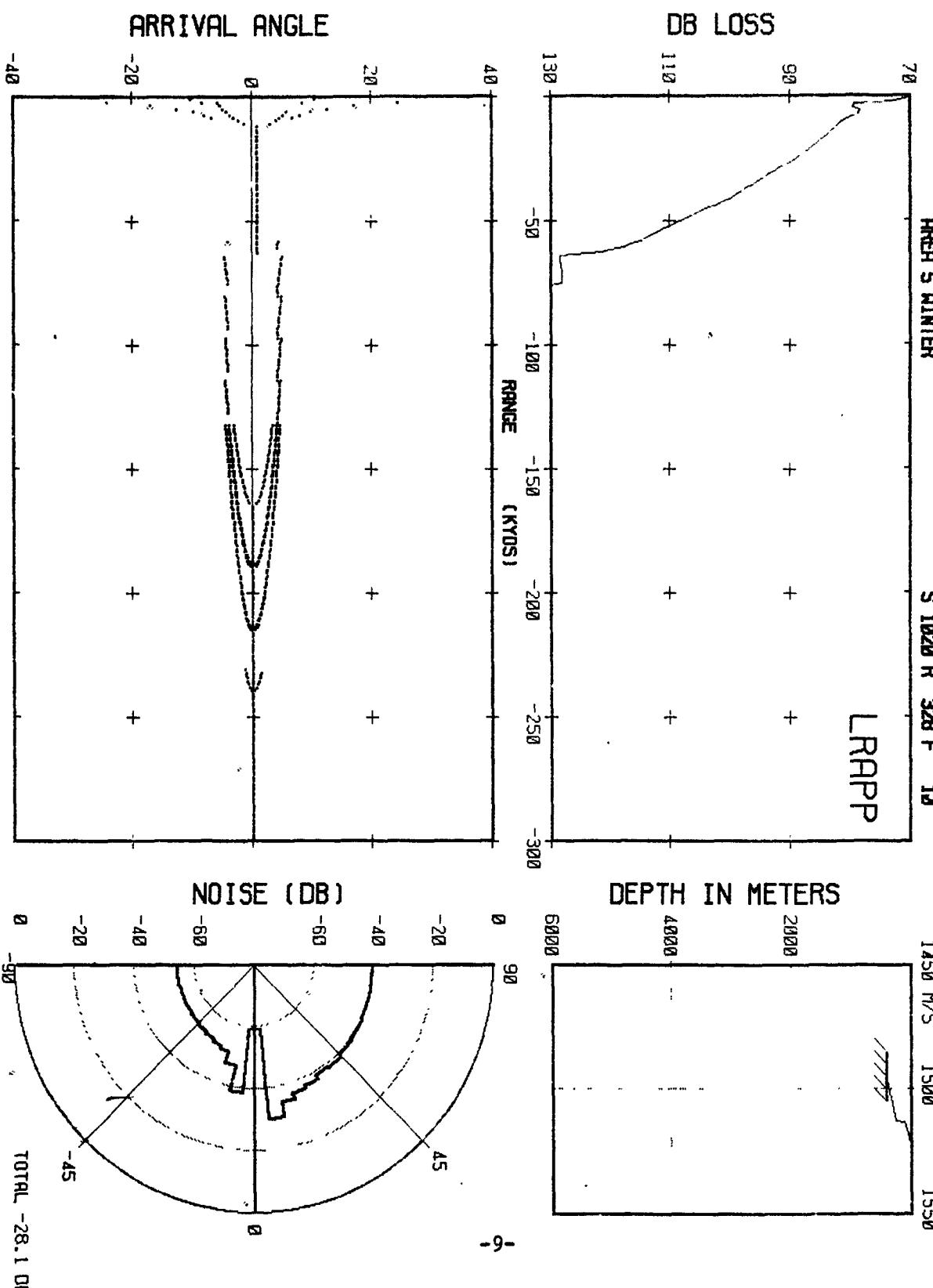
-8-

78

AREA 5 WINTER

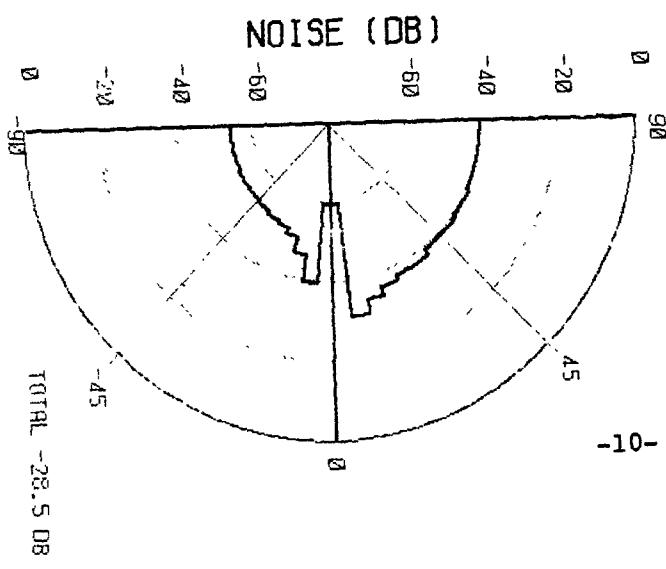
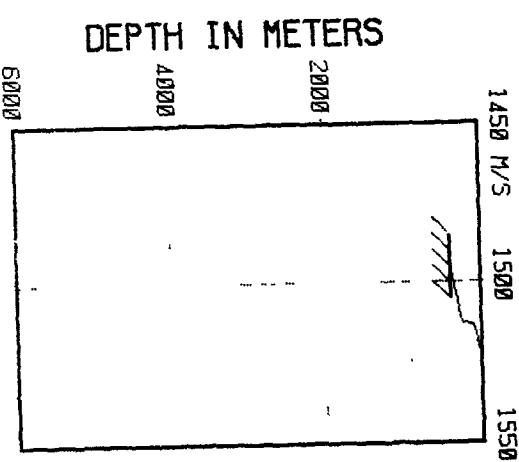
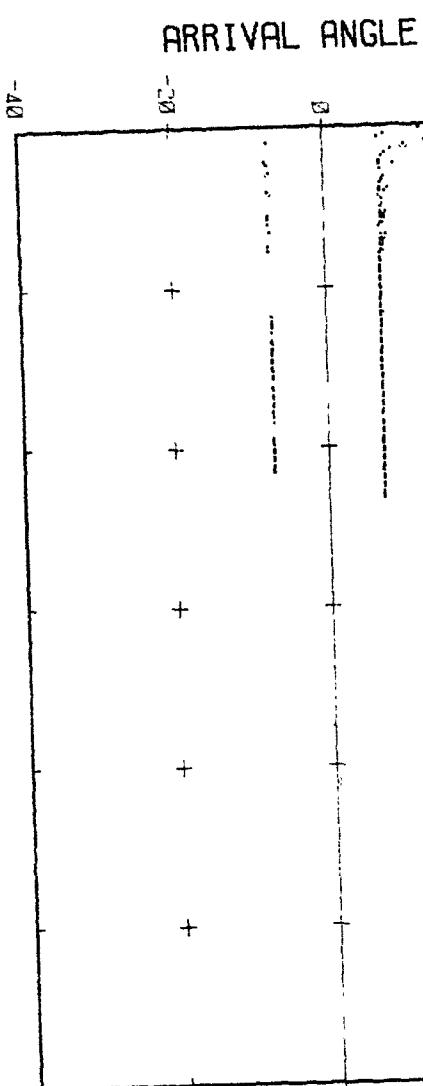
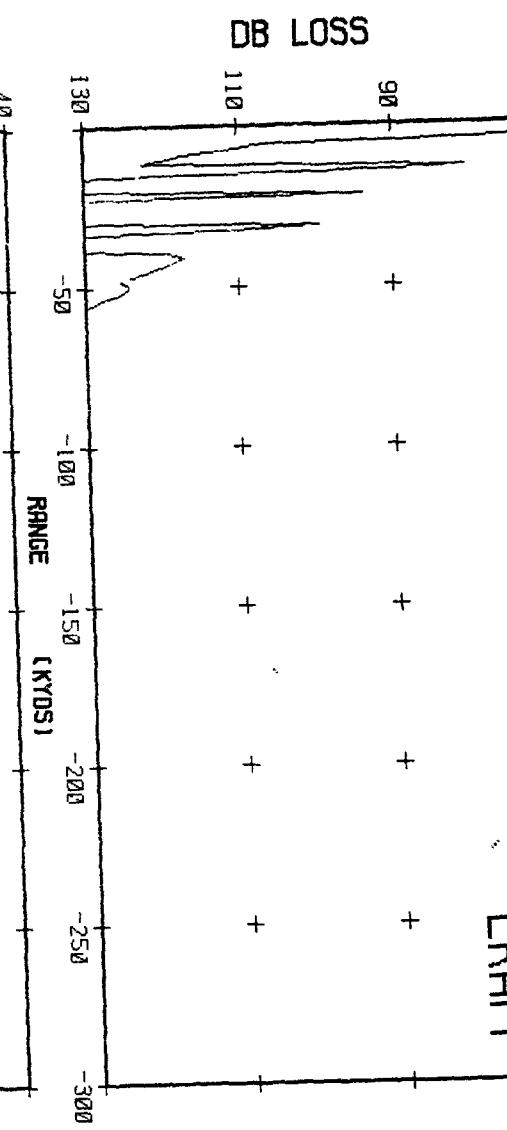
S 1820 R 328 F 11

1450 M/S 1500 1550



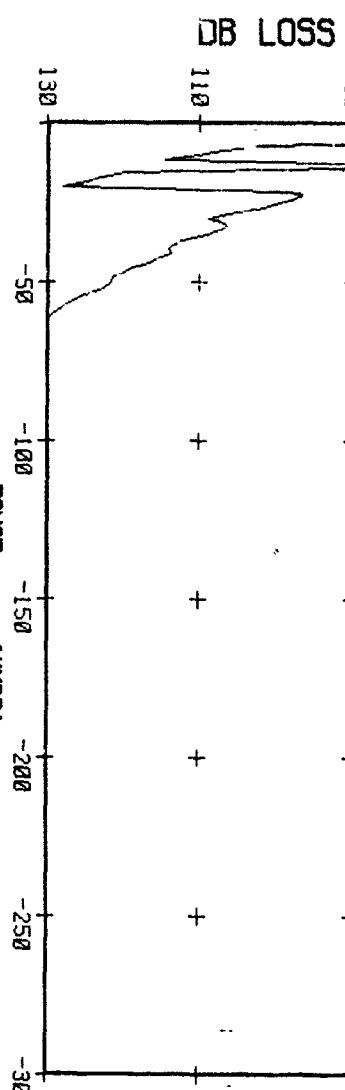
111

70 AREA 5 WINTER S 28 R 920 F 10 LRAPP

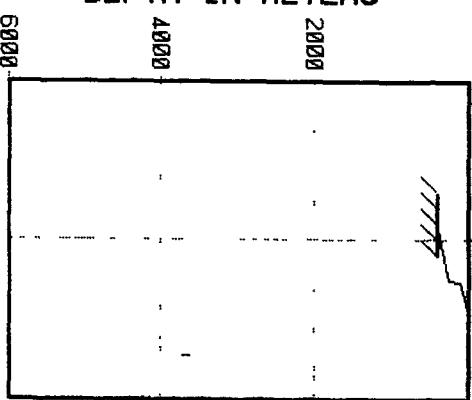


70
AFTER 5 WINTER S 50 R 920 F 10 1450 M/S 1500 1550

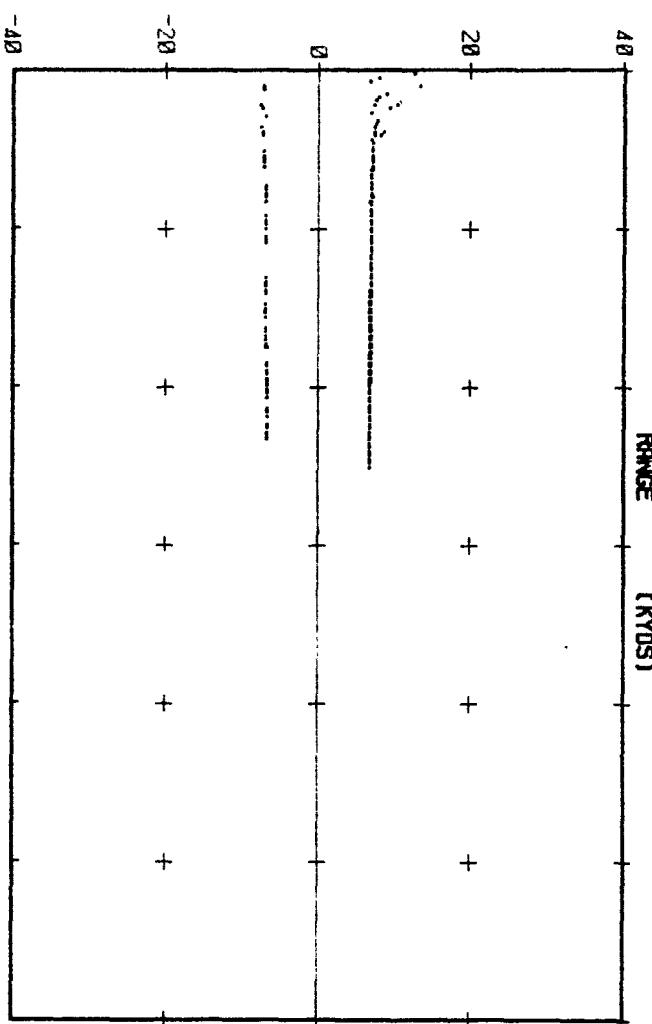
LRAPP



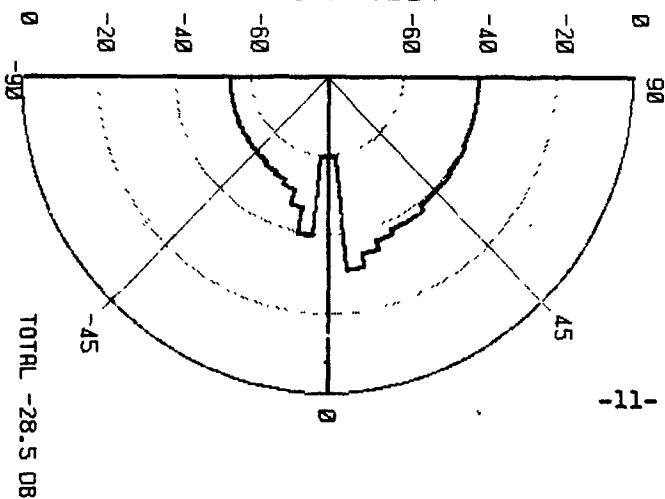
DEPTH IN METERS



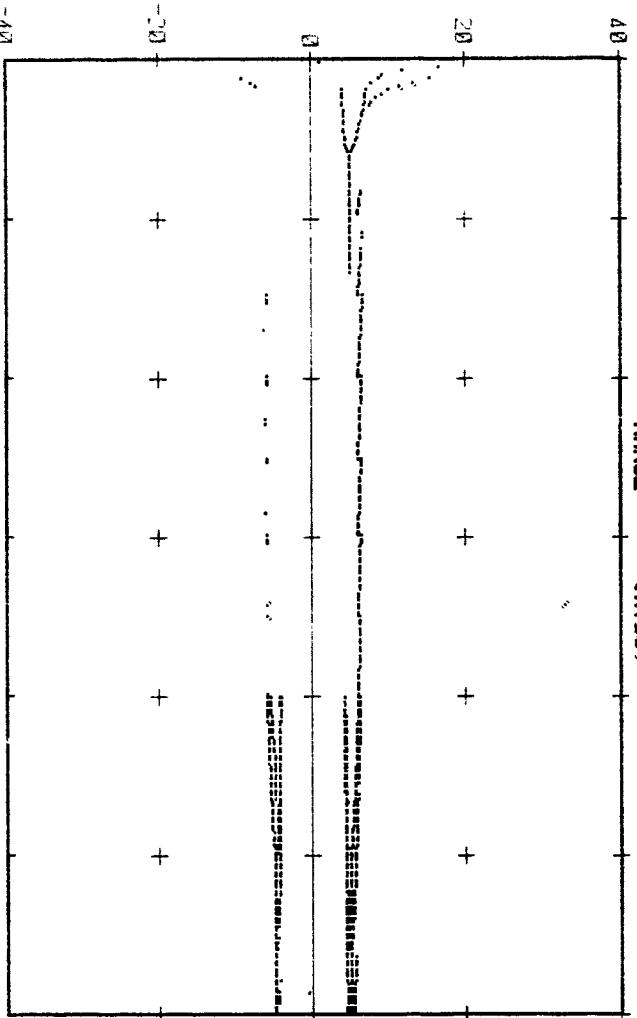
ARRIVAL ANGLE



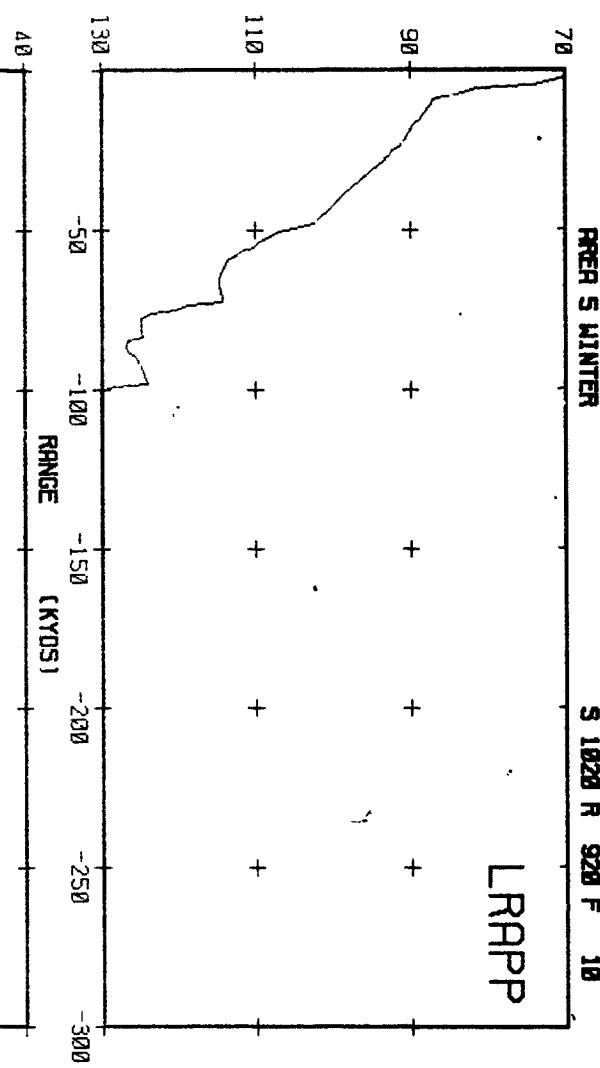
NOISE (DB)



ARRIVAL ANGLE

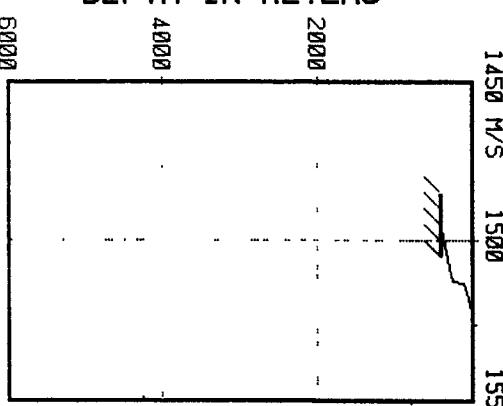


DB LOSS

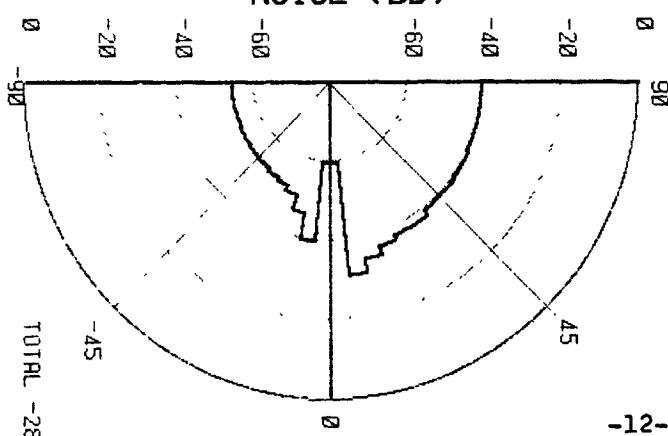


L RAPP

DEPTH IN METERS



NOISE (DB)



TOTAL -28.5 DB

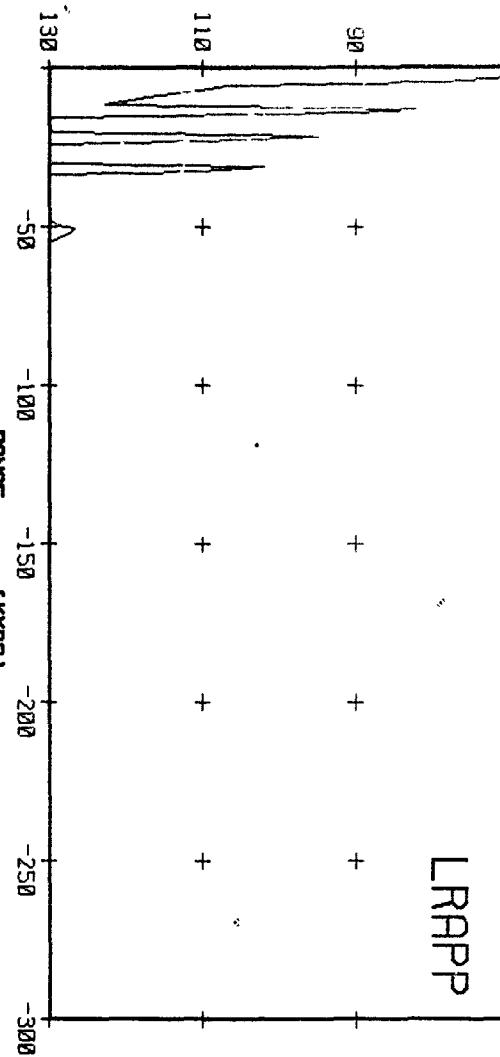


13

AKER 5 UNTER

3 20 R 1000 F 10

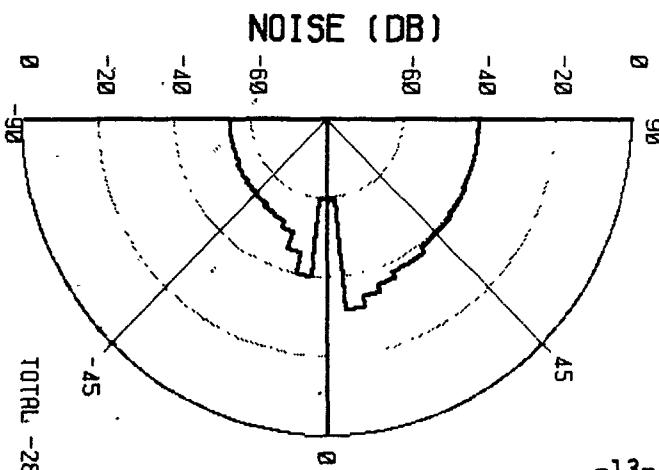
1450 145 1500 1550



ARRIVAL ANGLE

A graph with a vertical axis labeled from -40 to 40. A horizontal dashed line is drawn at $y = 0$. A series of points is plotted along a vertical line segment between $y = 20$ and $y = -20$. The points are marked with '+' signs. There are 10 '+' signs on the upper segment ($y > 0$) and 10 '+' signs on the lower segment ($y < 0$). The points are located at integer values of x from approximately -10 to 10.

DEPTH IN METERS



10 (HL) -28.6 dB

-13-

RECORDED BY
S. S. R. 10000 F. 10

RECORDED BY
S. S. R. 10000 F. 10

70

PER 5 WINTER

S 59 R. 10000 F. 10

1450 M/S 1500 1550

LRAPP

DB LOSS

90

+

+

+

+

+

+

130

+

+

+

+

+

+

0

90

-14-

-50

-100

-150

-200

-250

-300

40

20

0

-20

-40

-60

-80

-100

-120

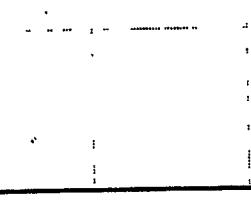
-14-

DEPTH IN METERS

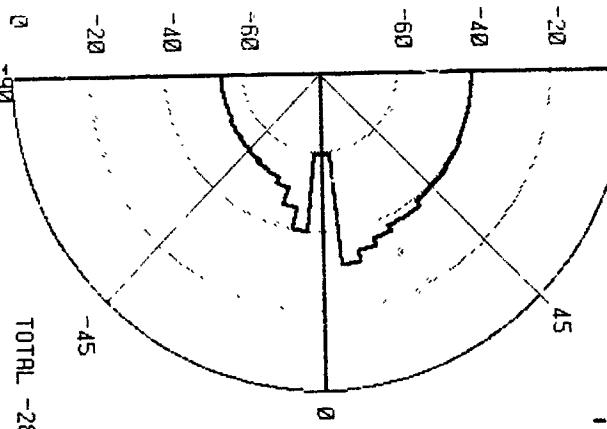
2000

4000

6000



NOISE (DB)



TOTAL -28.6 DB

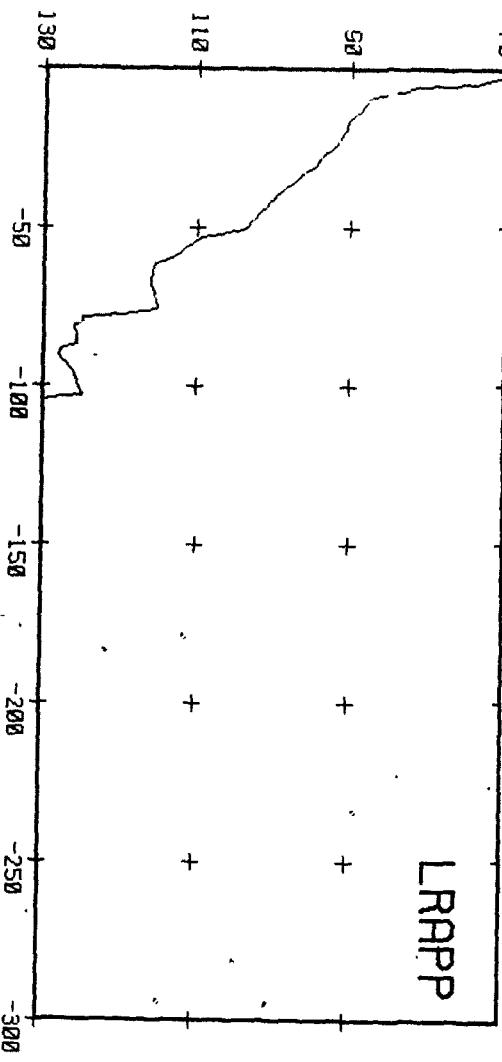
-40

AKER 5 WINTER

S 1020 R 1000 F 10

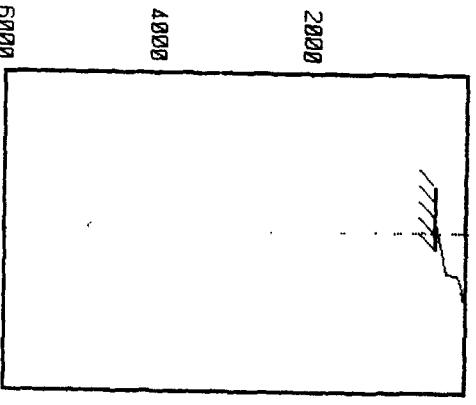
1450 M/S 1500 1550

DB LOSS

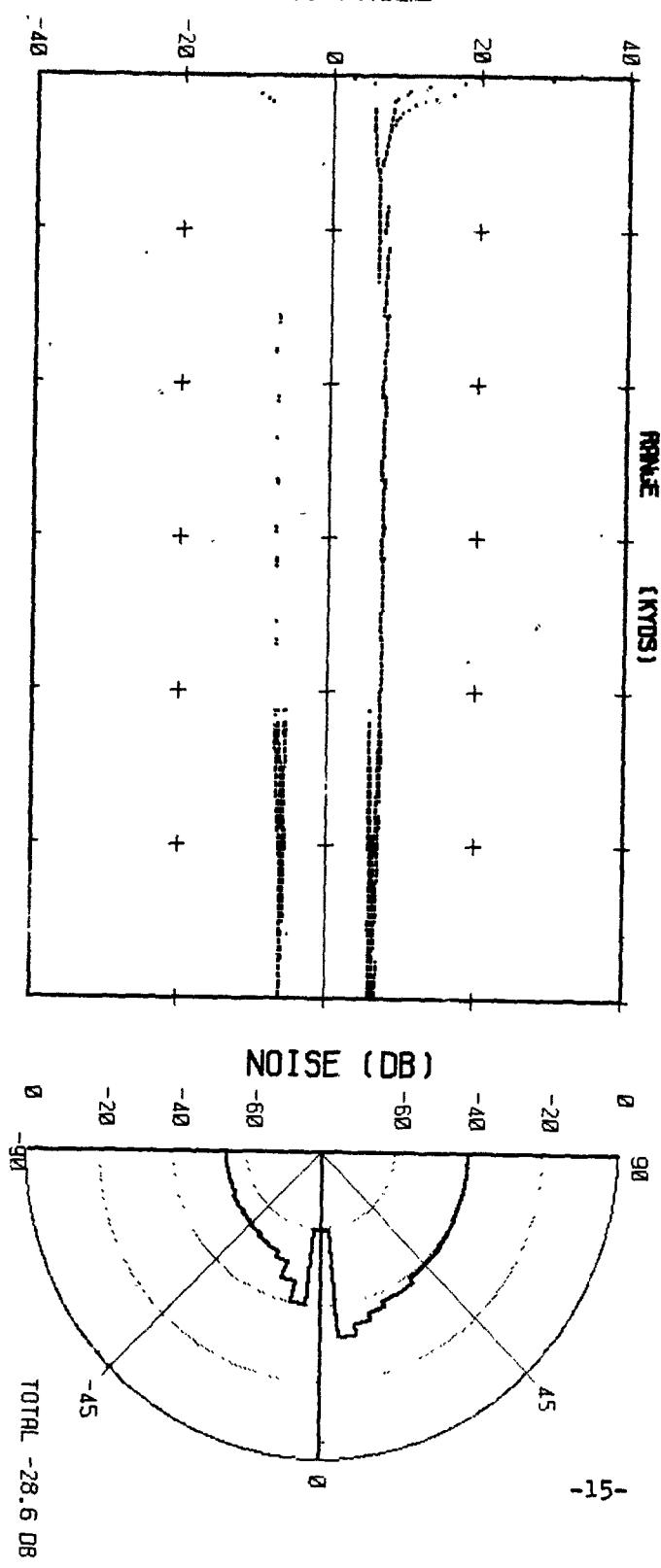


L RAPP

DEPTH IN METERS



NOISE (DB)



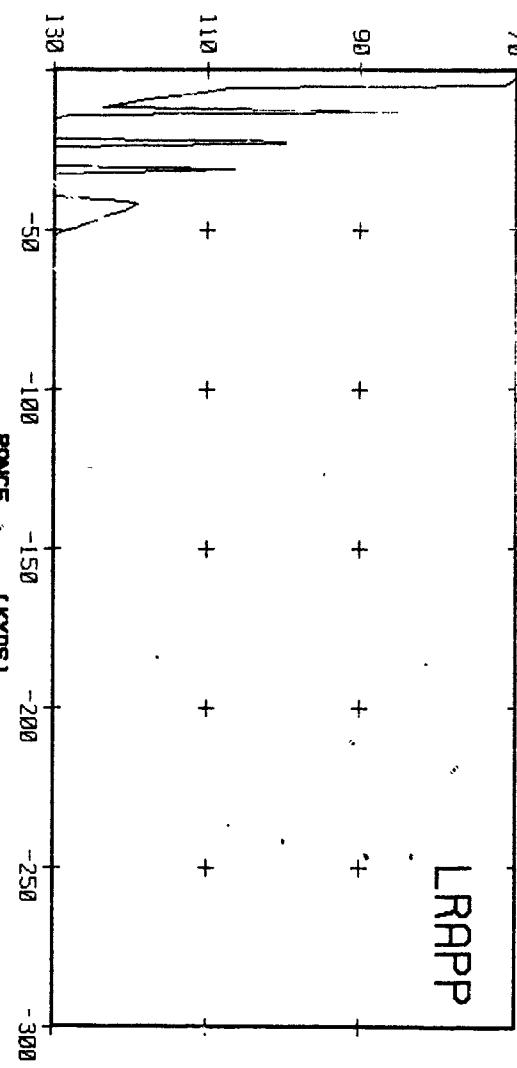
PREF 5 WINTER

S 20 R 1312 F 10

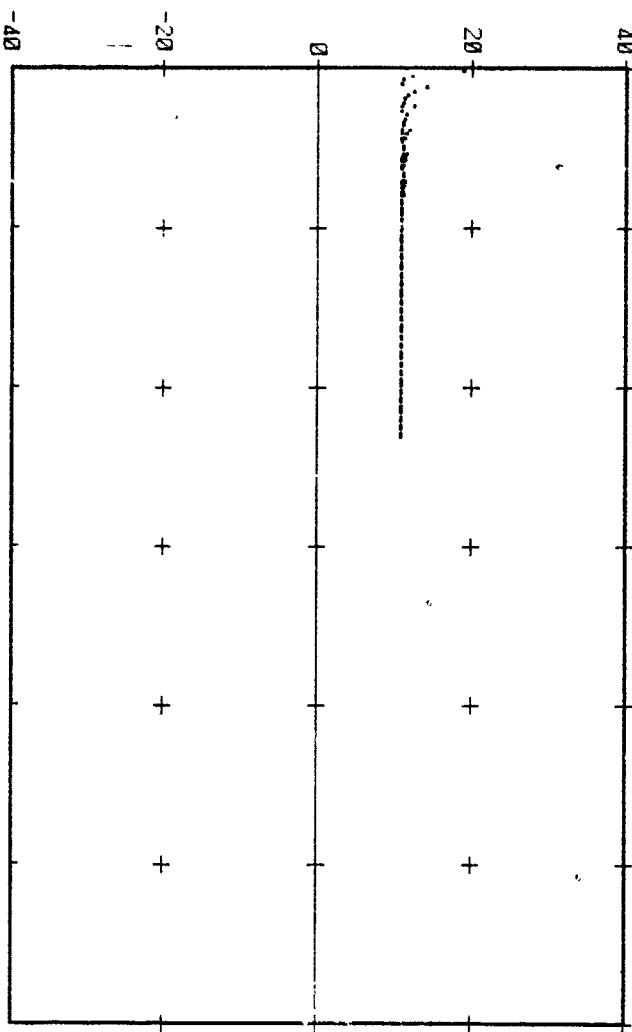
1450 M/S 1500 1550

LRAPP

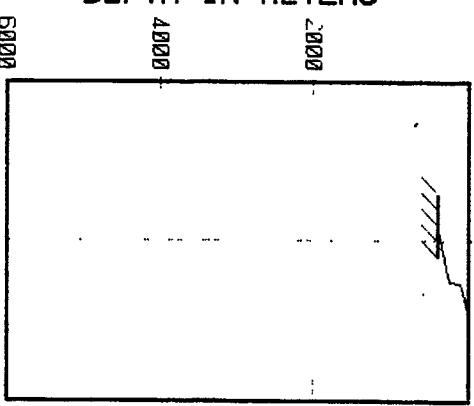
DB LOSS



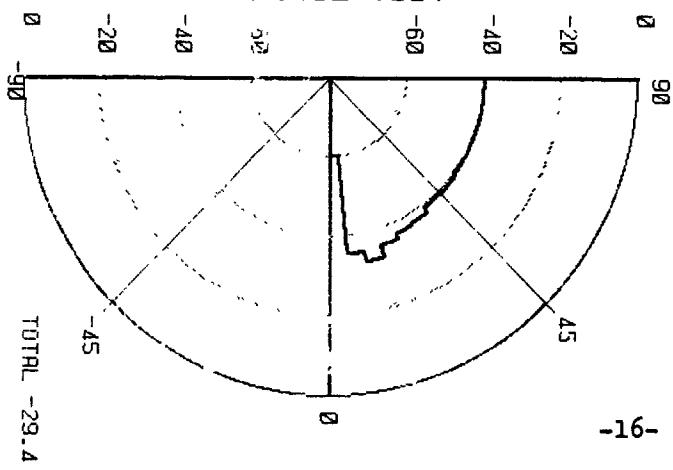
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



70

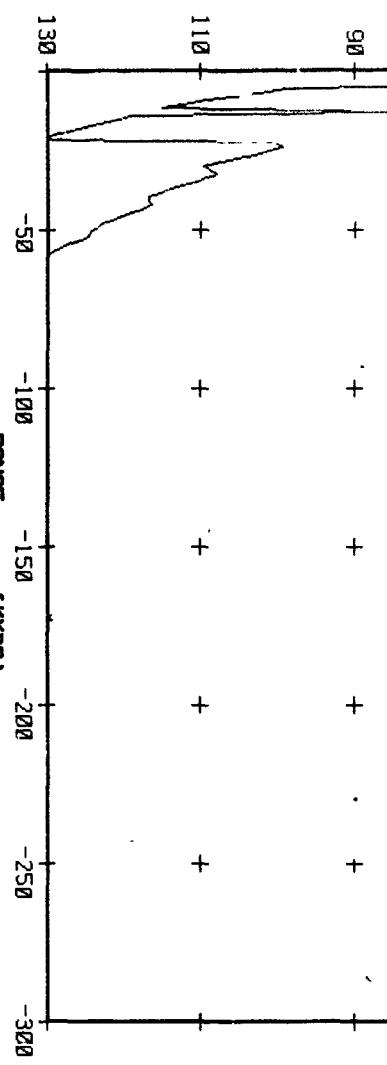
AREA 5 WINTER

S 50 R 1312 F 10

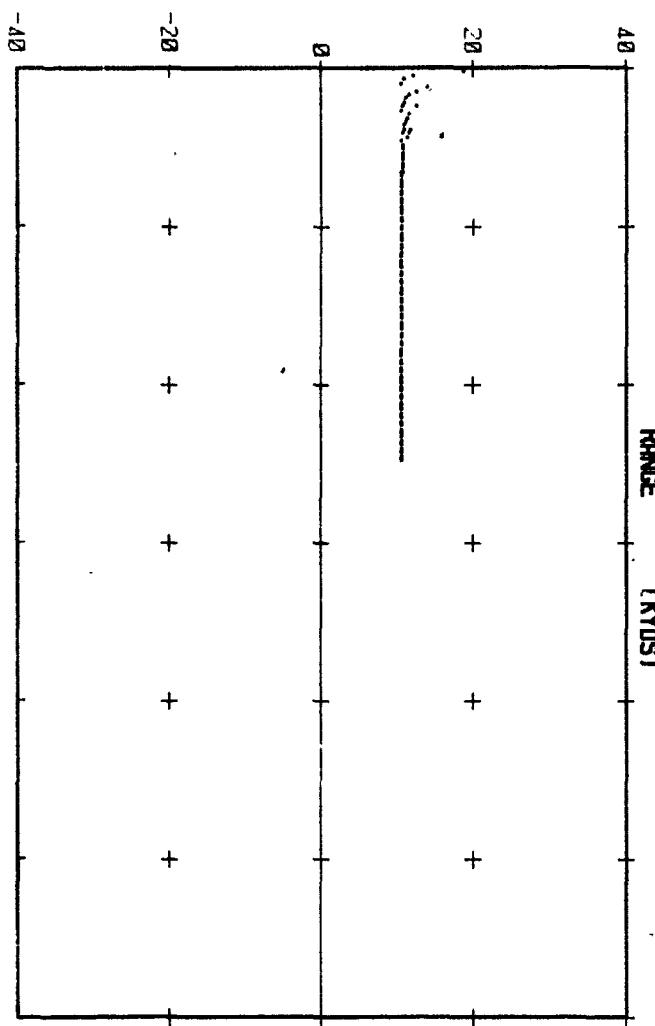
1450 M/S 1500 1550

LRAPP

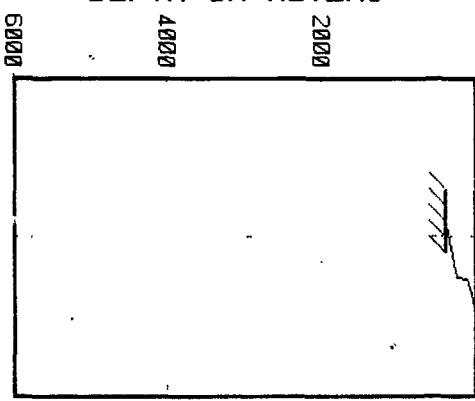
DB LOSS



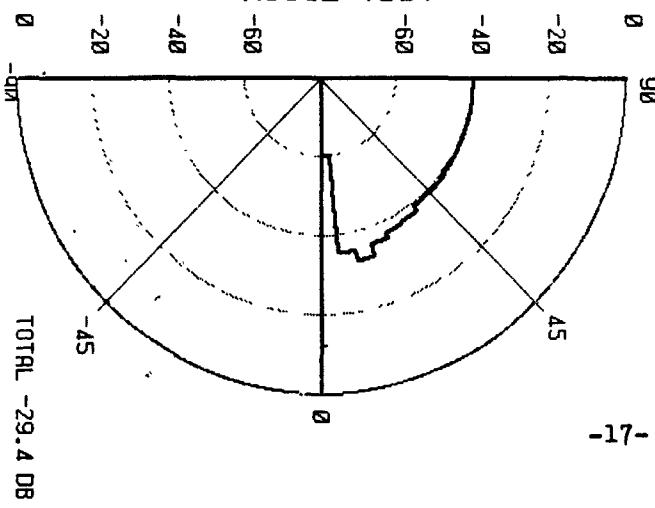
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



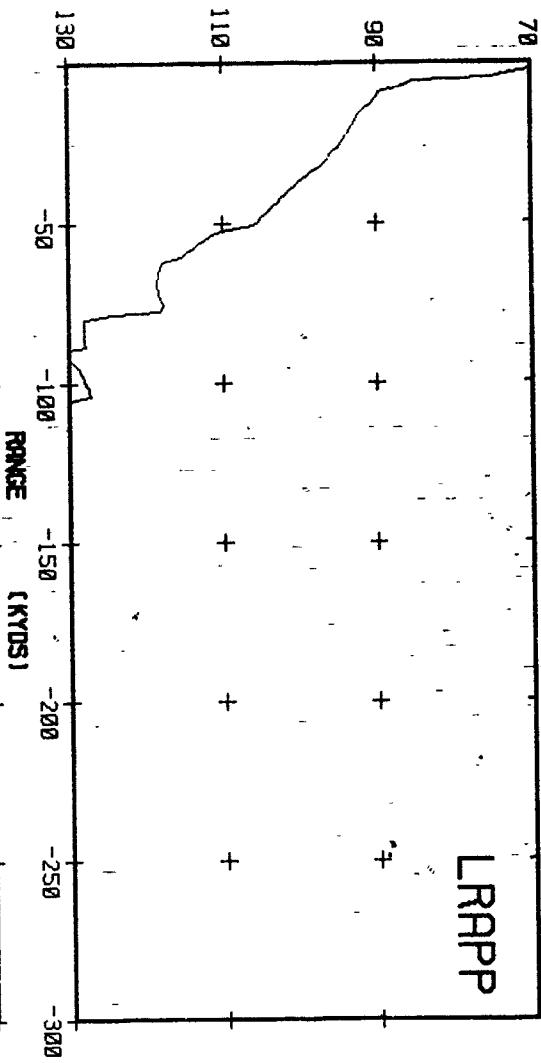
AREA 5 WINTER

S 1020 R 1312 F 10

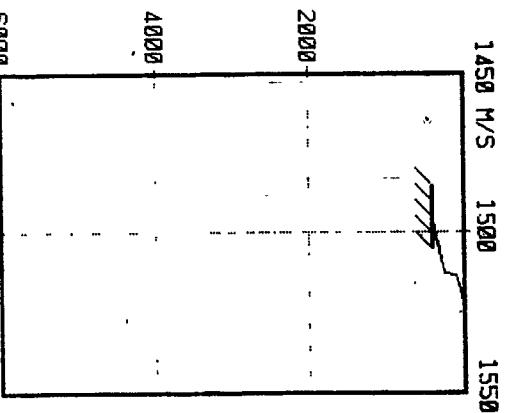
1450 M/S 1500

LRAAPP

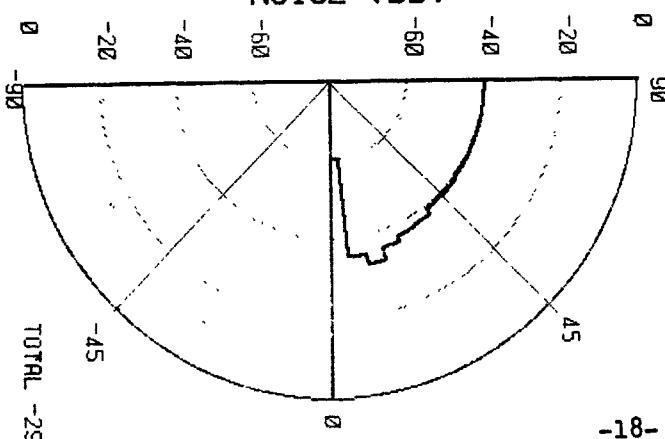
DB LOSS



DEPTH IN METERS



NOISE (DB)



AREA 5 WINTER

70

1450 M/S 1500 1550

LRAPP

DB LOSS

90

110

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

40

130

50

100

150

200

250

300

RANGE (KILOS)

0

6000

4000

2000

-

-

-

-

-

DEPTH IN METERS

ARRIVAL ANGLE

20

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

NOISE (DB)

0

90

45

40

30

20

10

0

+

-40

0

-90

-40

-30

-20

-10

0

+

+

+

78

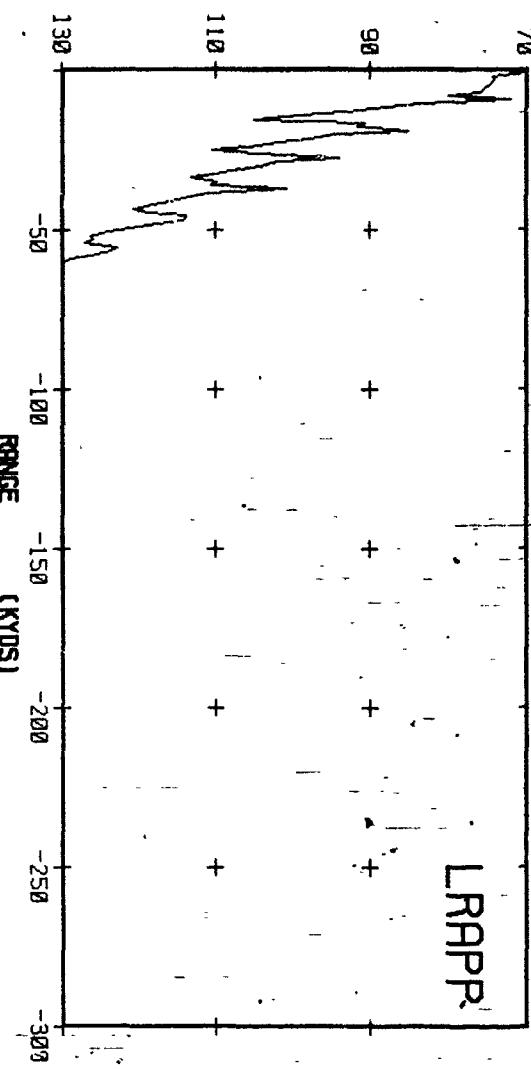
PAGER 5 WINTER

S 50 R 60 F 50

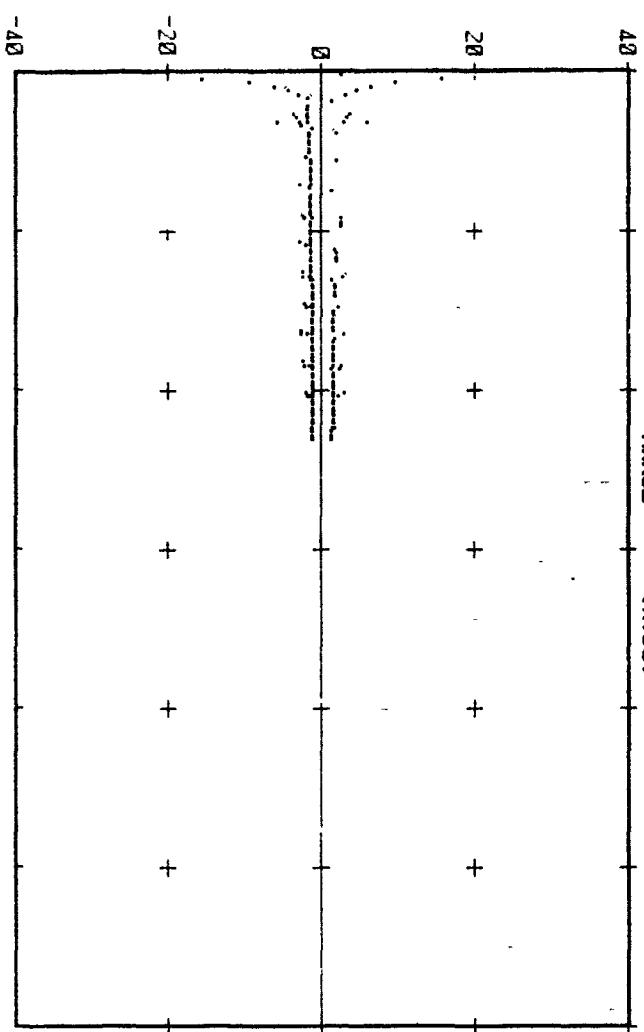
1450 M/S 1500 1550

LRAPP

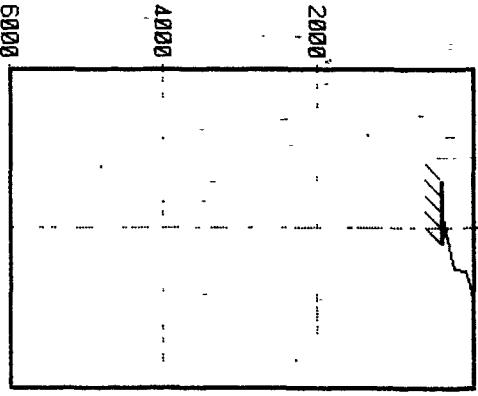
DB LOSS



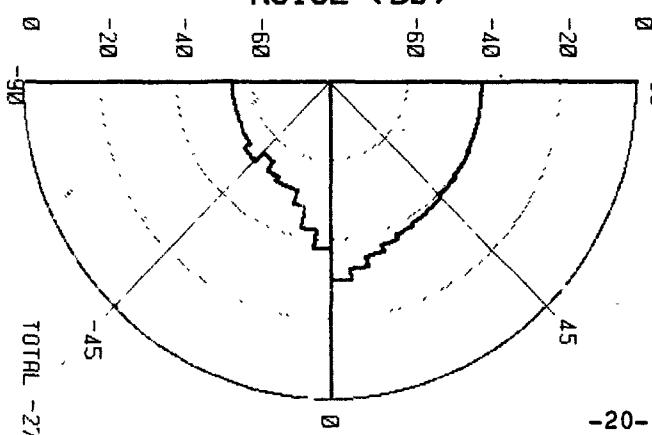
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -27.1 DB

78

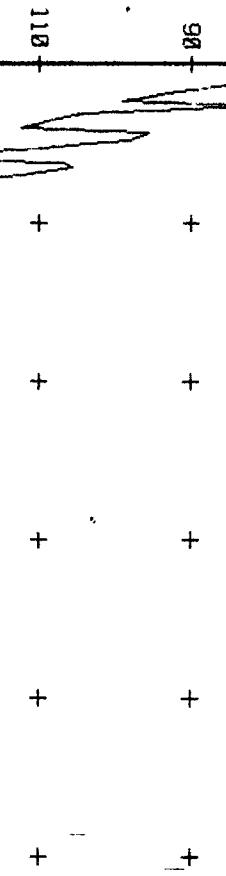
AREA 5 WINTER

S 1020 R 88 F 59

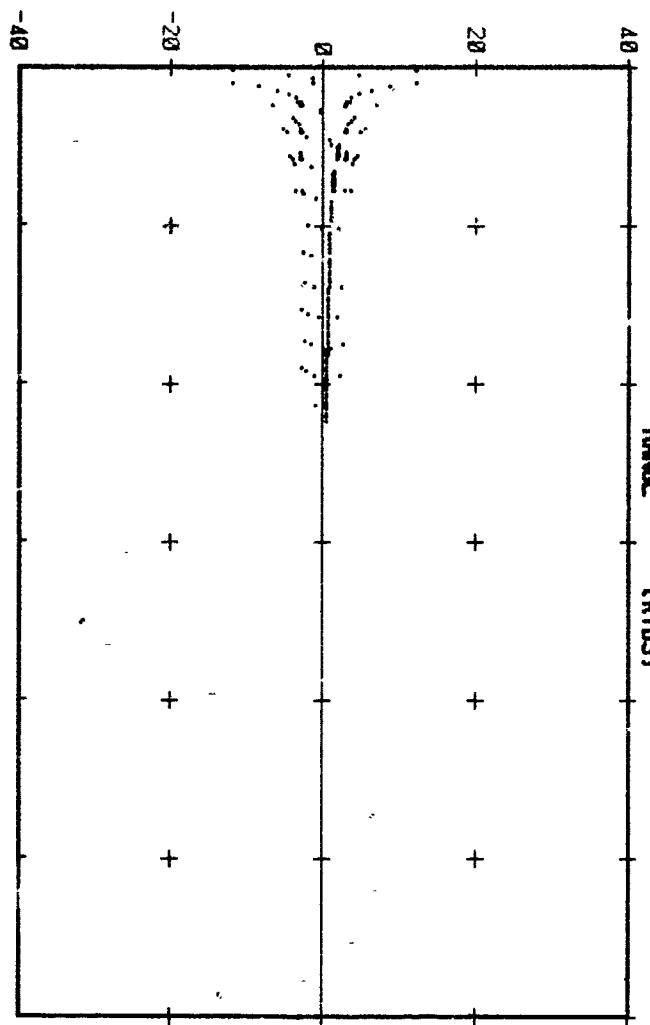
1450 M/S 1500 1550

LRAPP

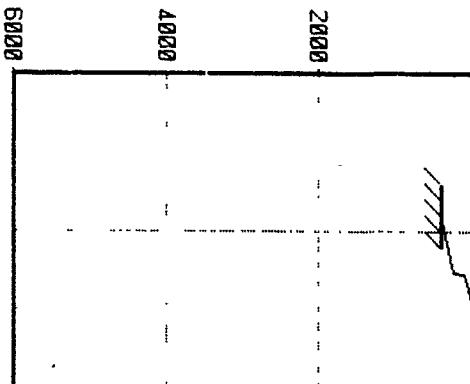
DB LOSS



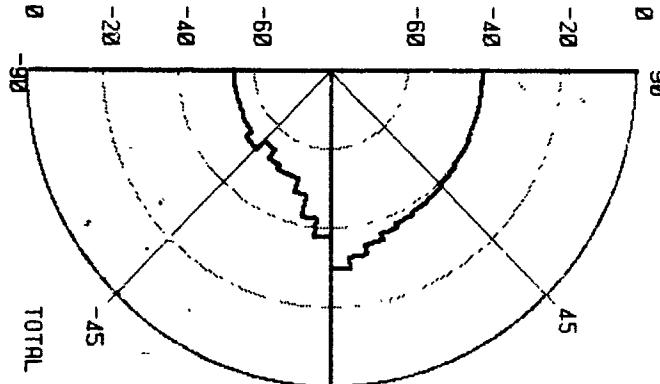
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -27.1 DB

RIVER 5 WINTER

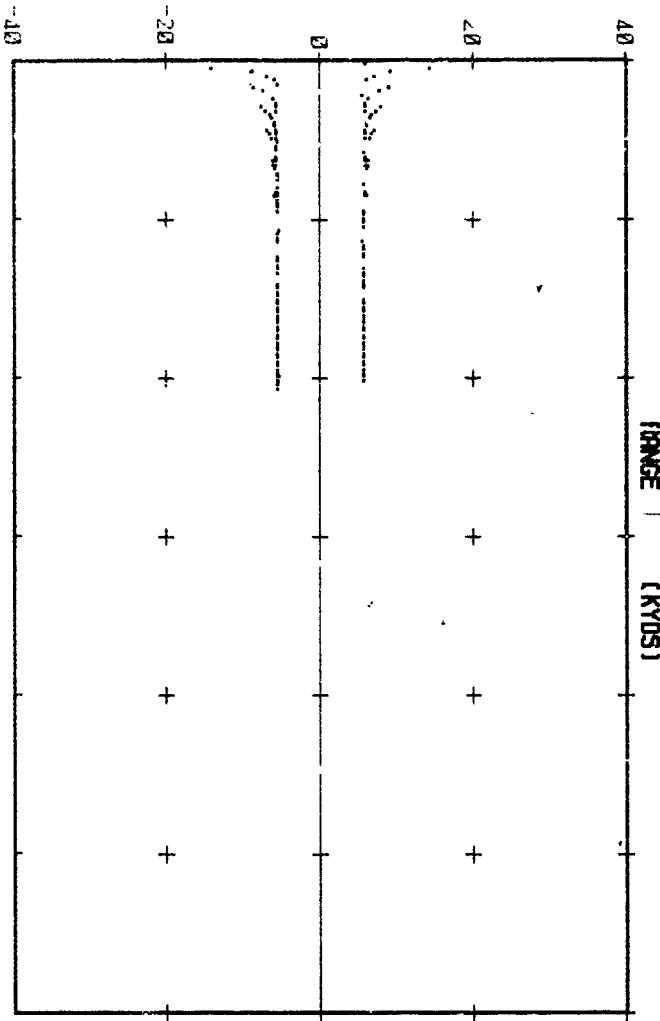
S 28 R 390 F 50

1450 M/S

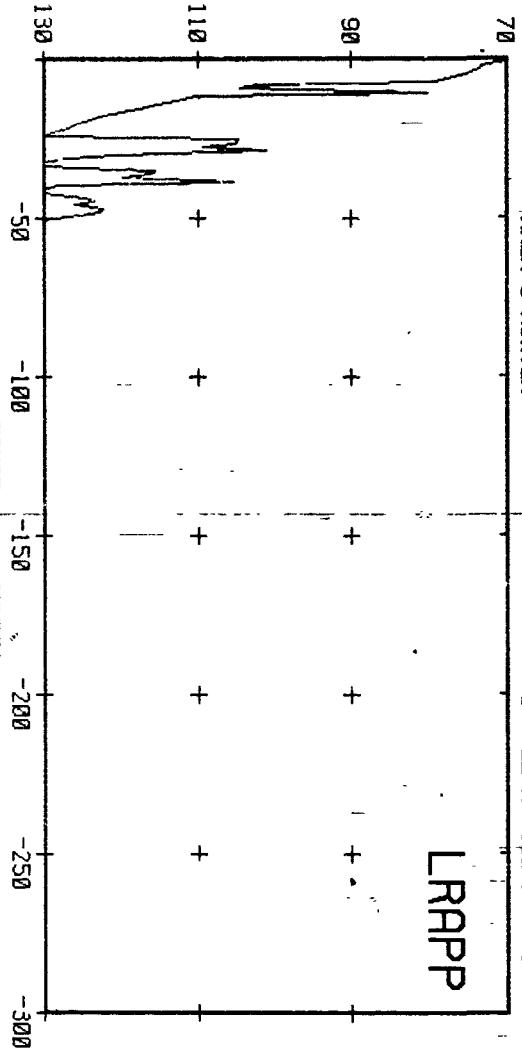
13500

1550

ARRIVAL ANGLE

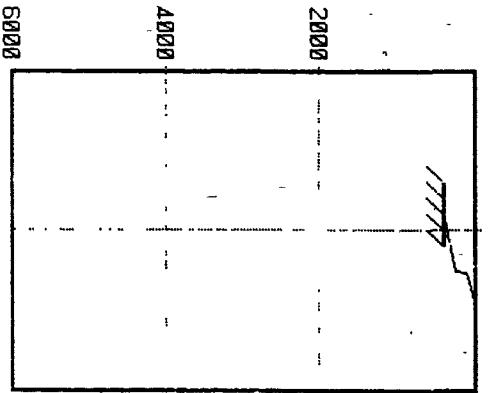


DB LOSS

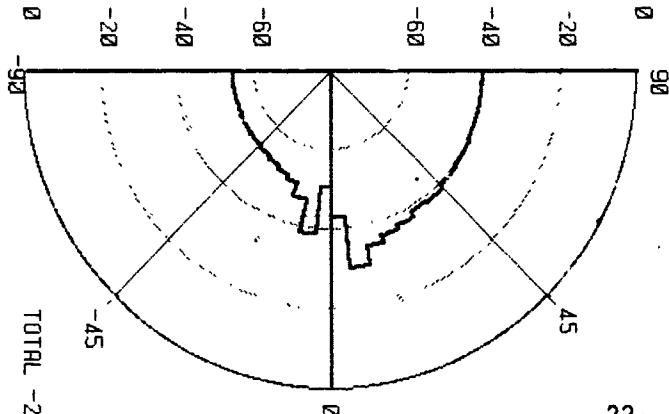


LRAPP

DEPTH IN METERS



NOISE (DB)



TOTAL -28.1 DB

70

ARR 5 WINTER

S 50 R 300 F 50

1450 M/S 1500 1550

LRAPP

DB LOSS

90

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

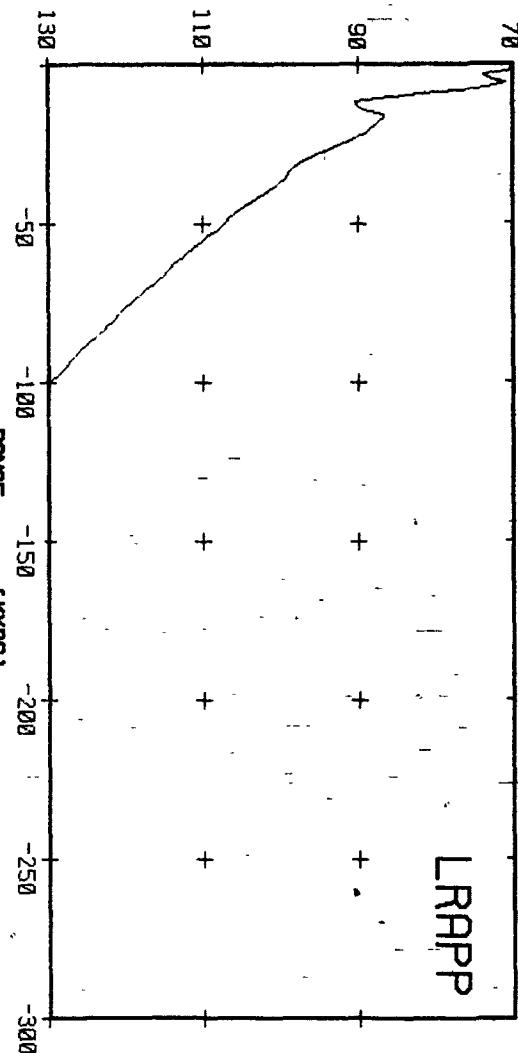
AREA 5 WINTER

S 1920 R 300 F 50

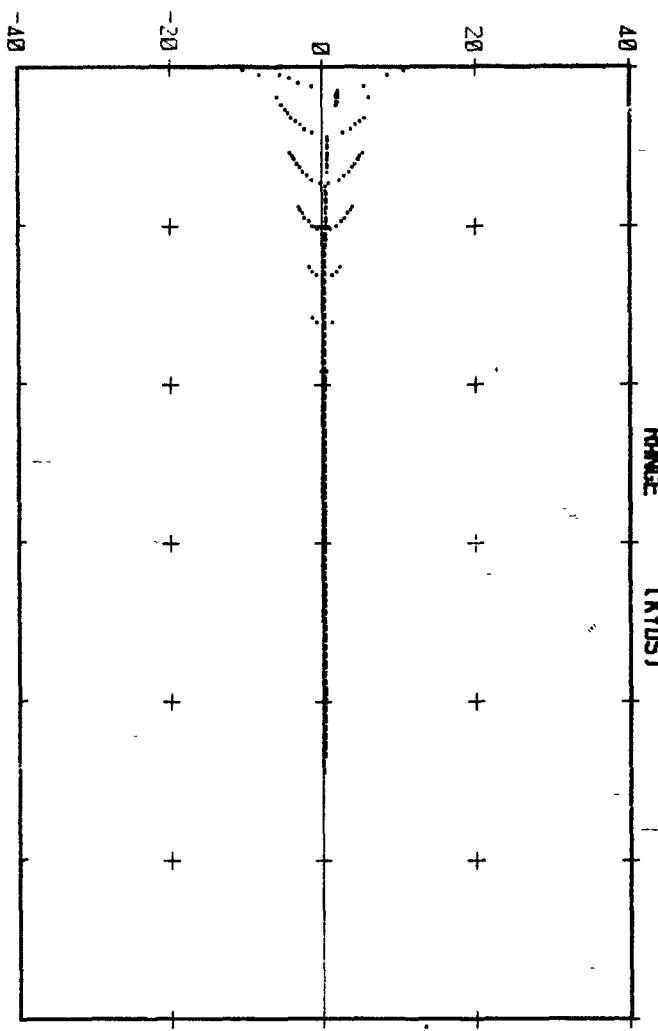
1450 M/S 1500 1550

LRAPP

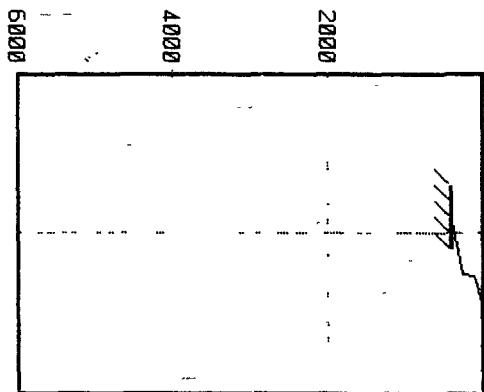
DB LOSS



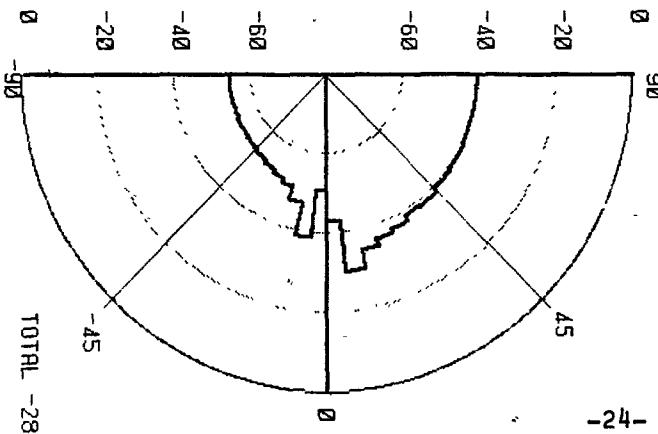
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -28.1 DB

-24-

AREA 5 WINTER

S 28 R 328 F 50

1450 M/S 1500 1550

LRAAPP

DB LOSS

90 + + + + +

110 + + + + +

130 -50 -100 -150 -200 -250 -300
RANGE (KMS)

DEPTH IN METERS

2000

4000

6000

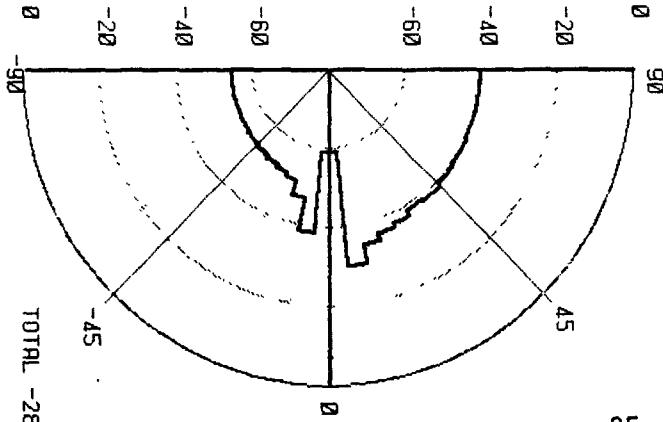
0

ARRIVAL ANGLE

20 + + + + +
0 + + + + +
-20 + + + + +

-40

NOISE (DB)



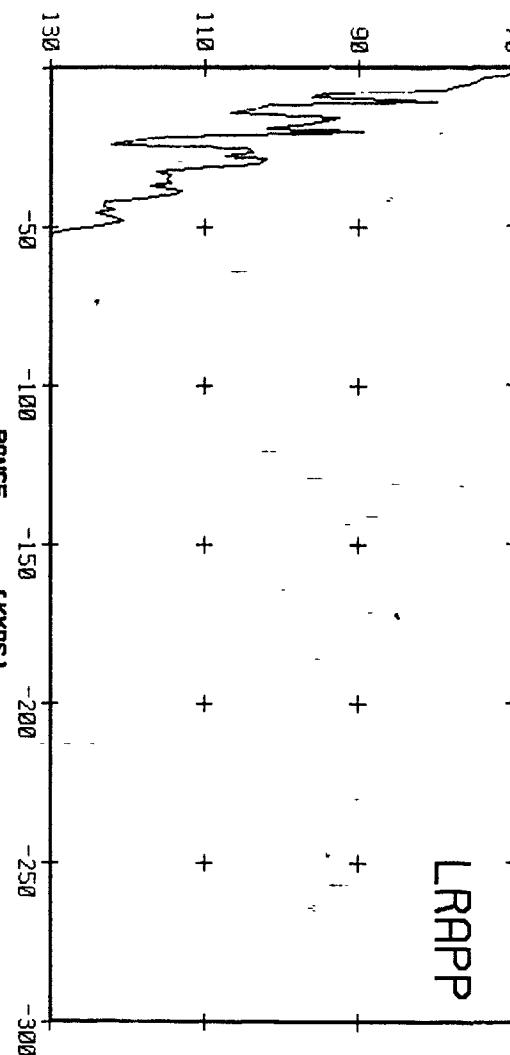
AREA 5 WINTER

S 50 R 328 F 50

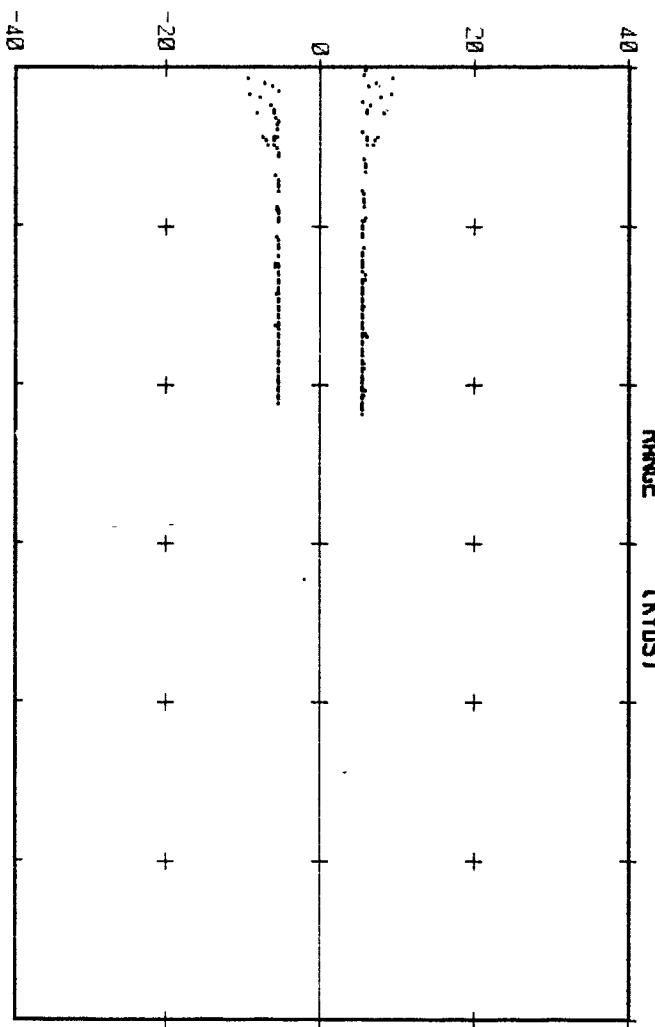
1450 M/S 1500 1550

LRAPP

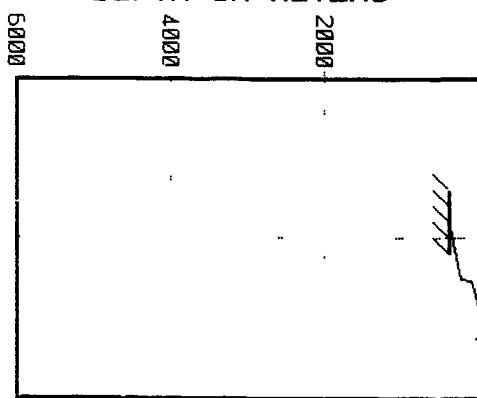
DB LOSS



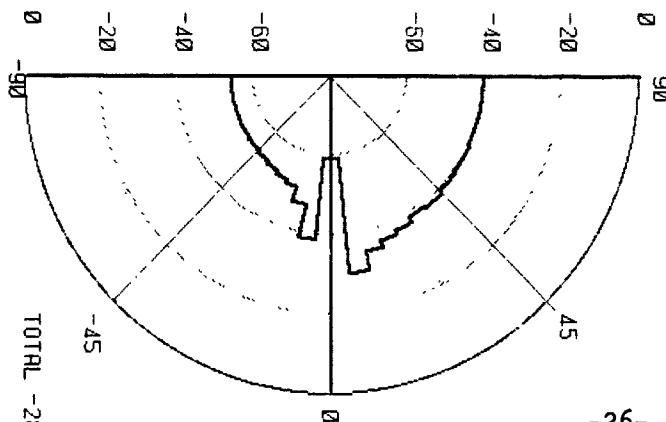
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -28.1 DB

AREA 5 WINTER

S 1020 R 328 F 58

1450 M/S 1500 1550

L RAPP

DB LOSS

90 + + + + +

2000

110 + + + + +

4000

130 -50 -100 -150 -200 -250 -300

RANGE (KTS)

6000

0

-27-

DEPTH IN METERS

4000

2000

0

NOISE (DB)

90

60

30

0

-30

-60

-90

-120

-150

-180

-210

-240

-270

-300

-330

-360

-390

-420

-450

-480

-510

-540

-570

-600

-630

-660

-690

-720

-750

-780

-810

-840

-870

-900

-930

-960

-990

-1020

-1050

-1080

-1110

-1140

-1170

-1200

-1230

-1260

-1290

-1320

-1350

-1380

-1410

-1440

-1470

-1500

-1530

-1560

-1590

-1620

-1650

-1680

-1710

-1740

-1770

-1800

-1830

-1860

-1890

-1920

-1950

-1980

-2010

-2040

-2070

-2100

-2130

-2160

-2190

-2220

-2250

-2280

-2310

-2340

-2370

-2400

-2430

-2460

-2490

-2520

-2550

-2580

-2610

-2640

-2670

-2700

-2730

-2760

-2790

-2820

-2850

-2880

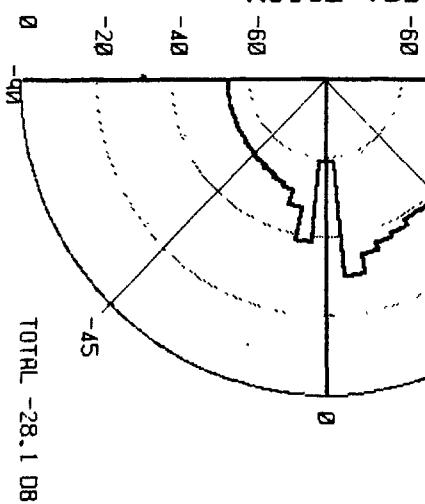
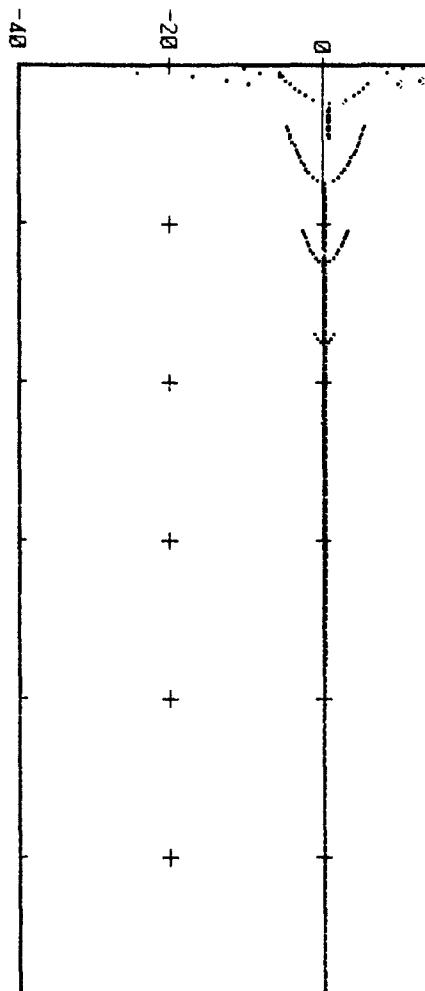
-2910

-2940

-2970

-3000

ARRIVAL ANGLE



TOTAL -28.1 DB

-27-

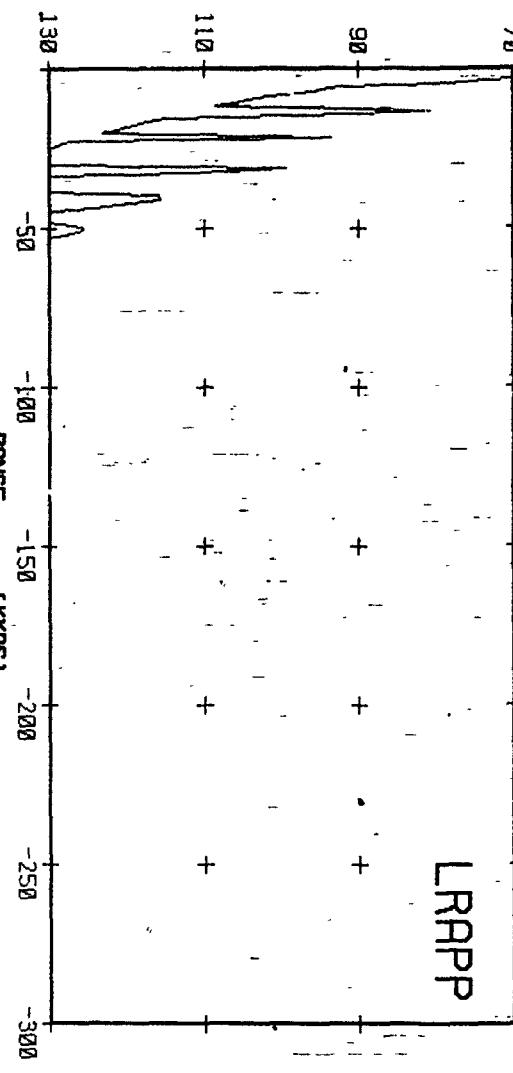
AREA 5 WINTER

S 20 R 920 F 50

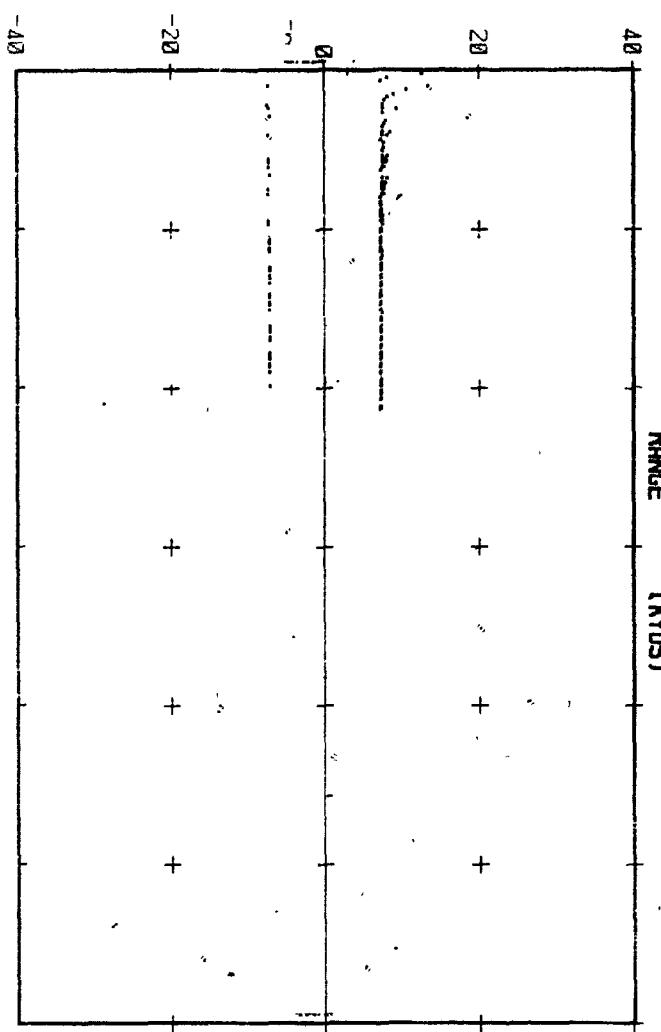
1450 M/S 1500 1550

L RAPP

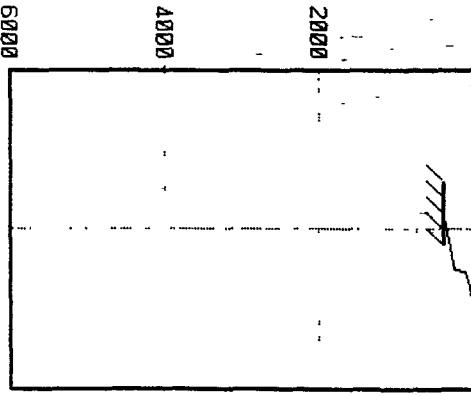
DB LOSS



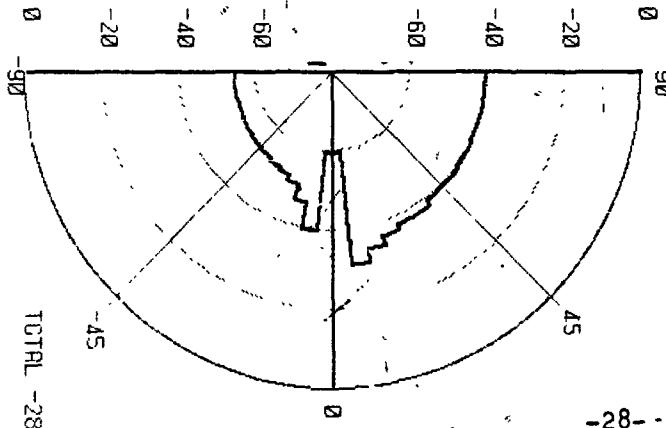
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



ARRER 5 WINTER

S

50 R 920 F 50

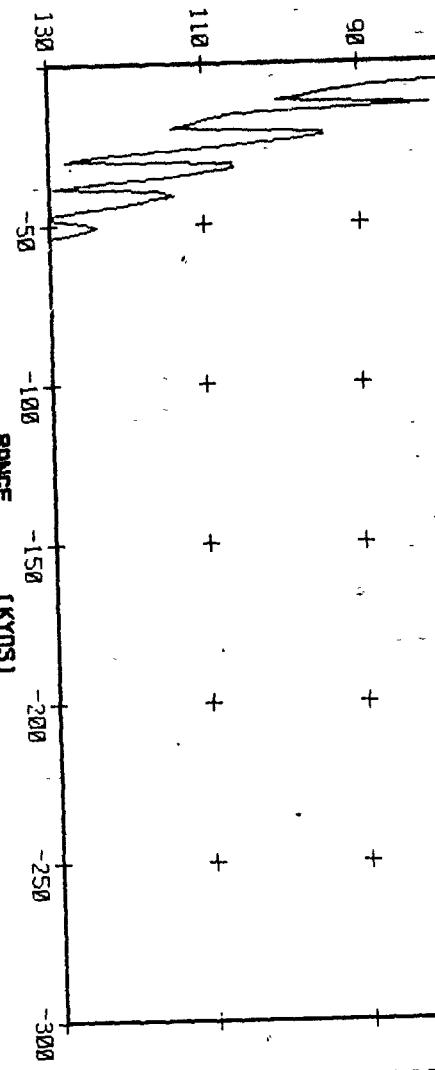
1450 M/S 1500 1550

7.8

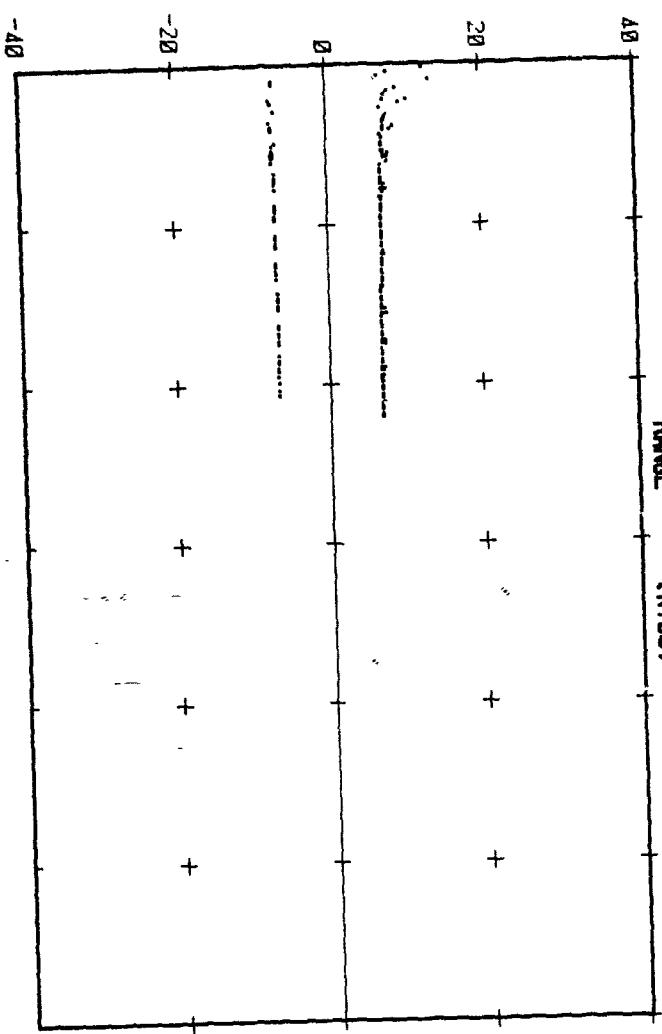
ARRER 5 WINTER

L RAPP

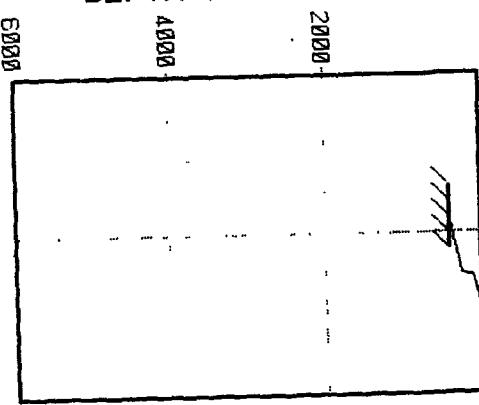
DB LOSS



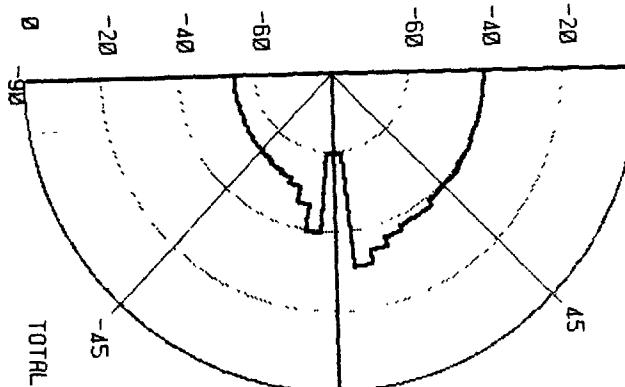
ARRIVAL ANGLE



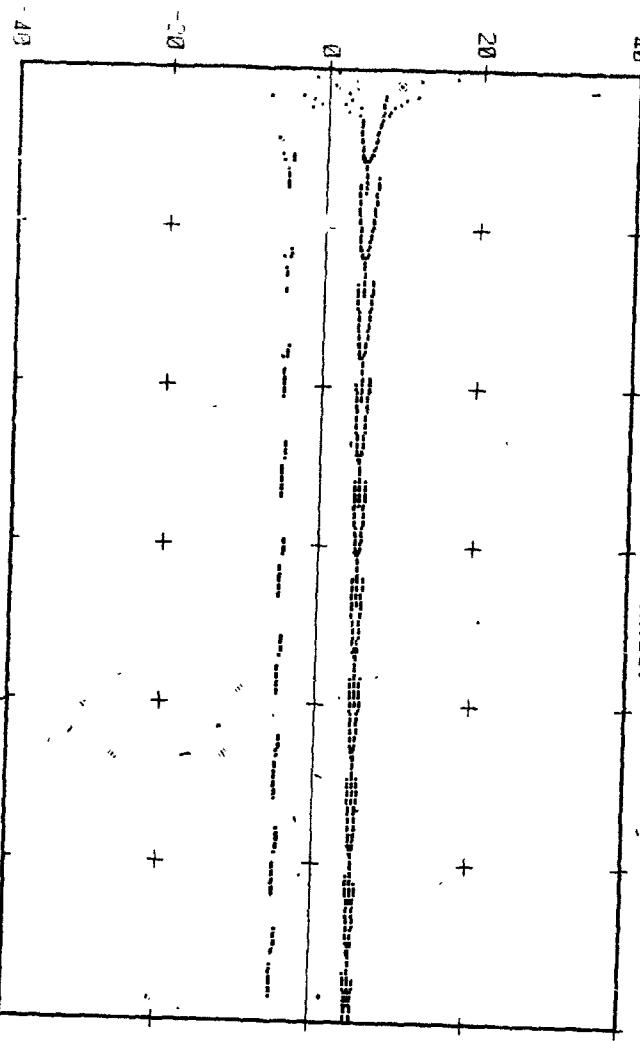
DEPTH IN METERS



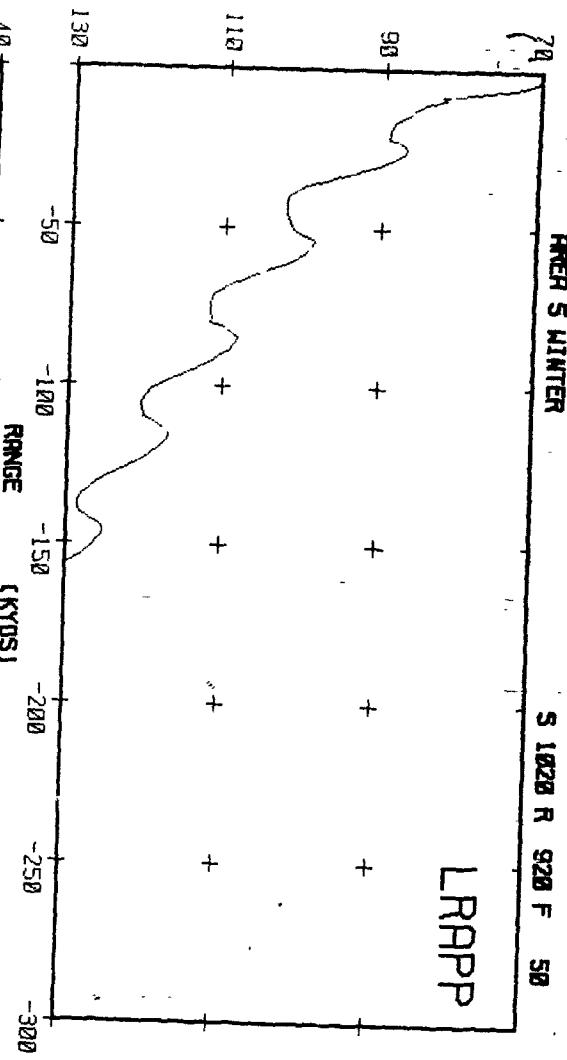
NOISE (DB)



ARRIVAL ANGLE

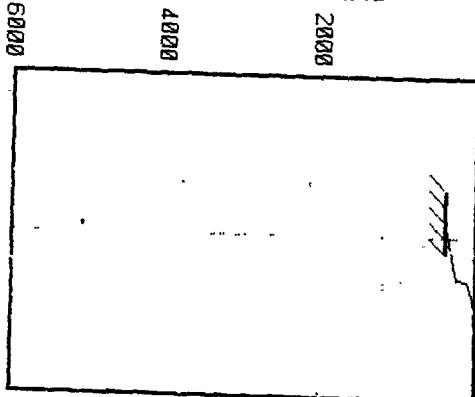


DB LOSS

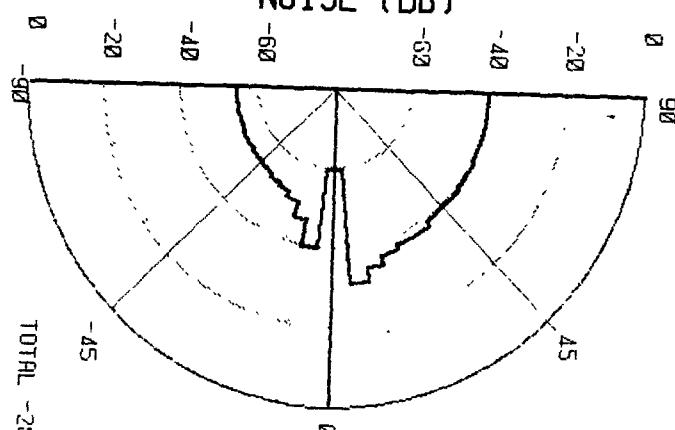


L RAPP

DEPTH IN METERS



NOISE (DB)



70

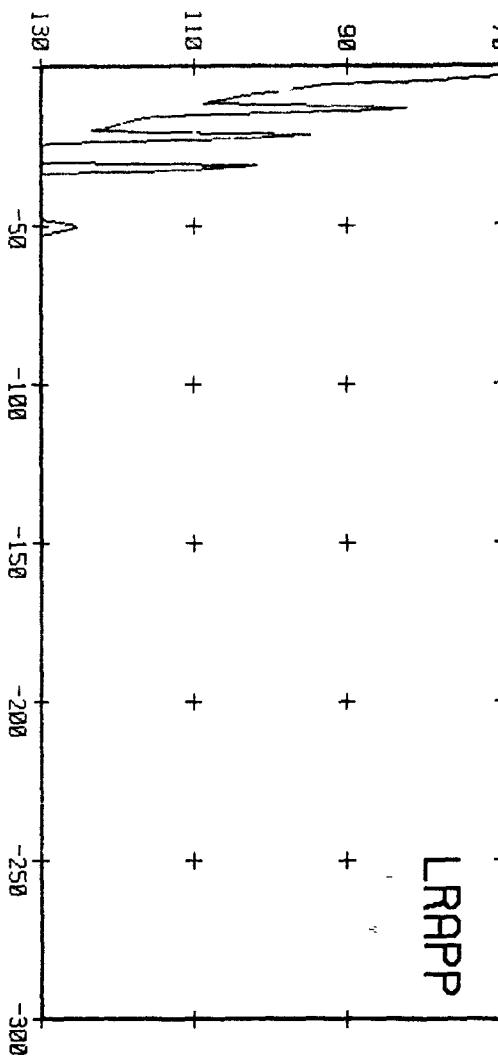
AREA 5 WINTER

S 20 R 1600 F 50

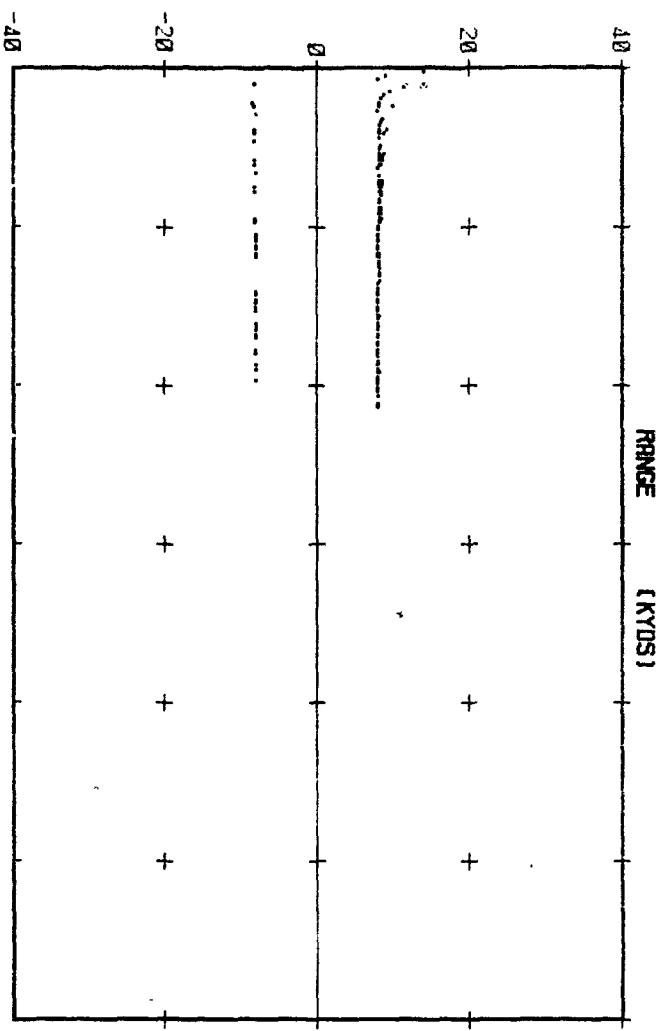
1450 M/S 1500 1550

LRAPP

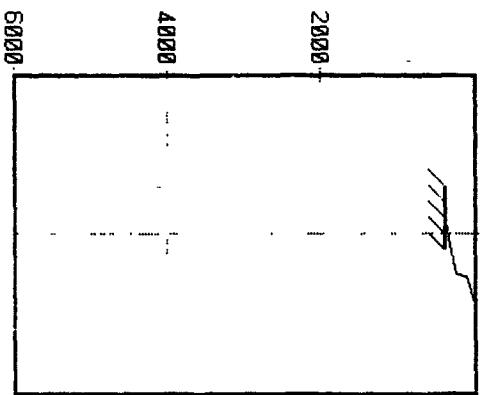
DB LOSS



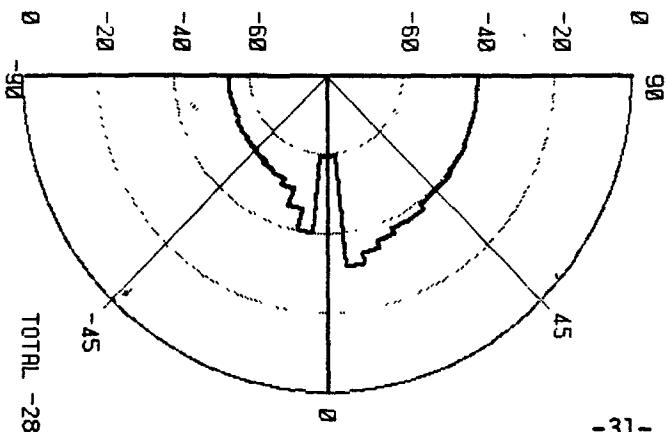
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -28.6 DB

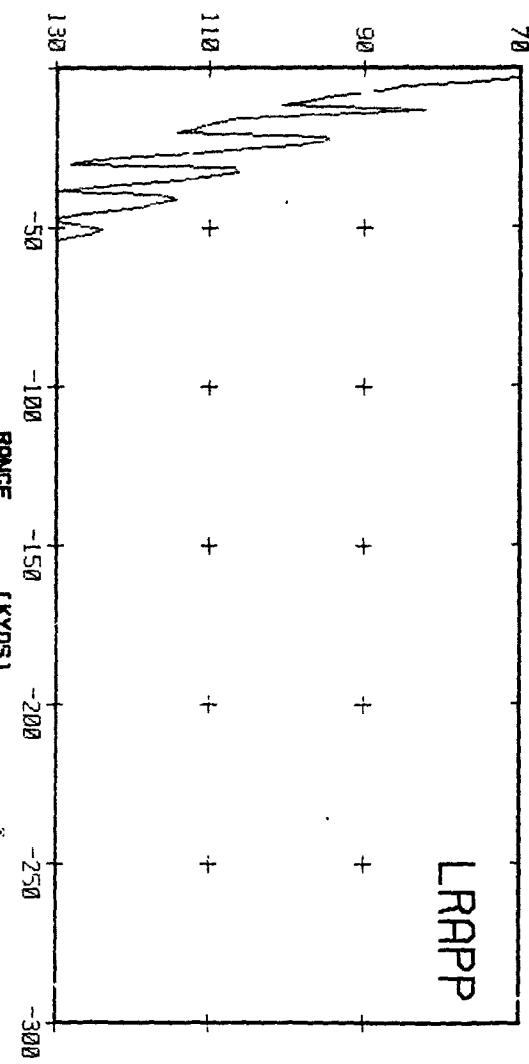
AREA 5 WINTER

S 50 R 1000 F 50

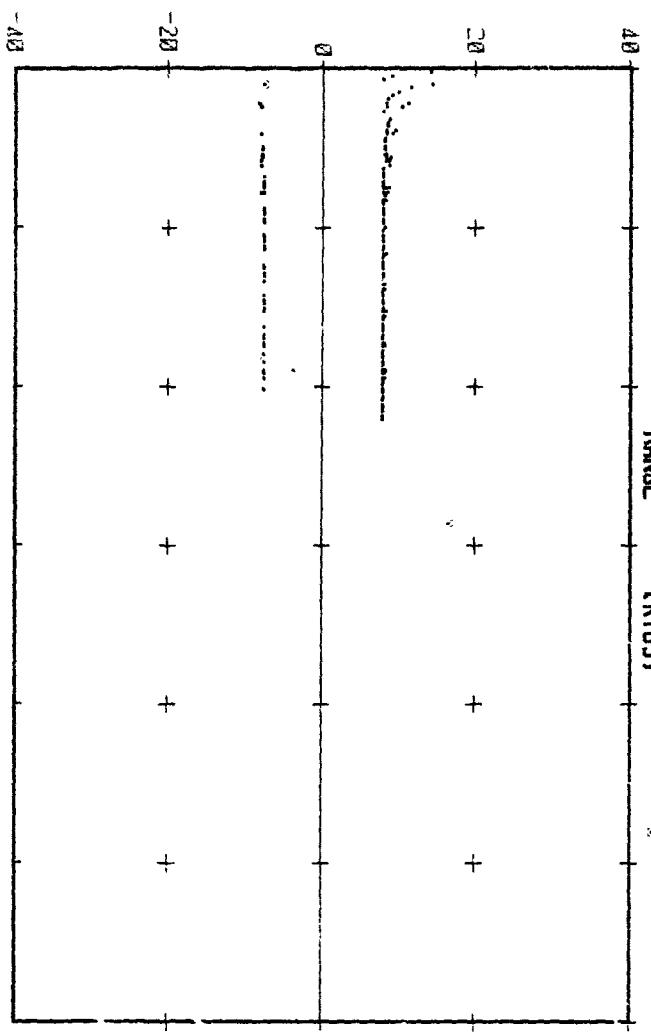
1450 M/S 1500 1550

LRRAPP

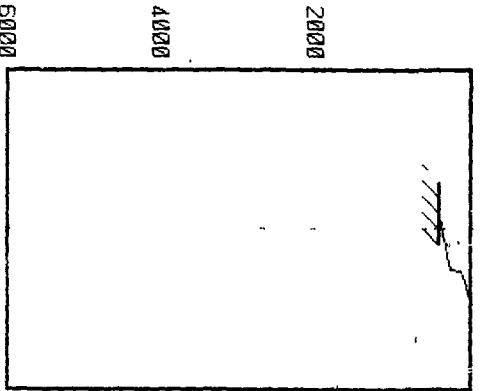
DB LOSS



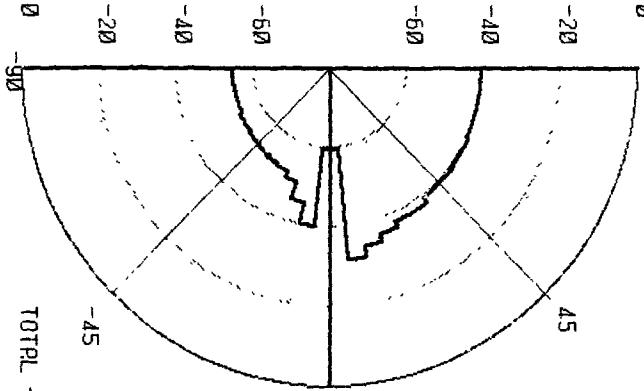
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



70

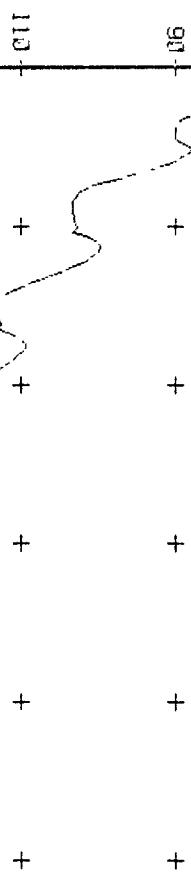
ARRER 5 WINTER

S 1020 R 1000 F 50

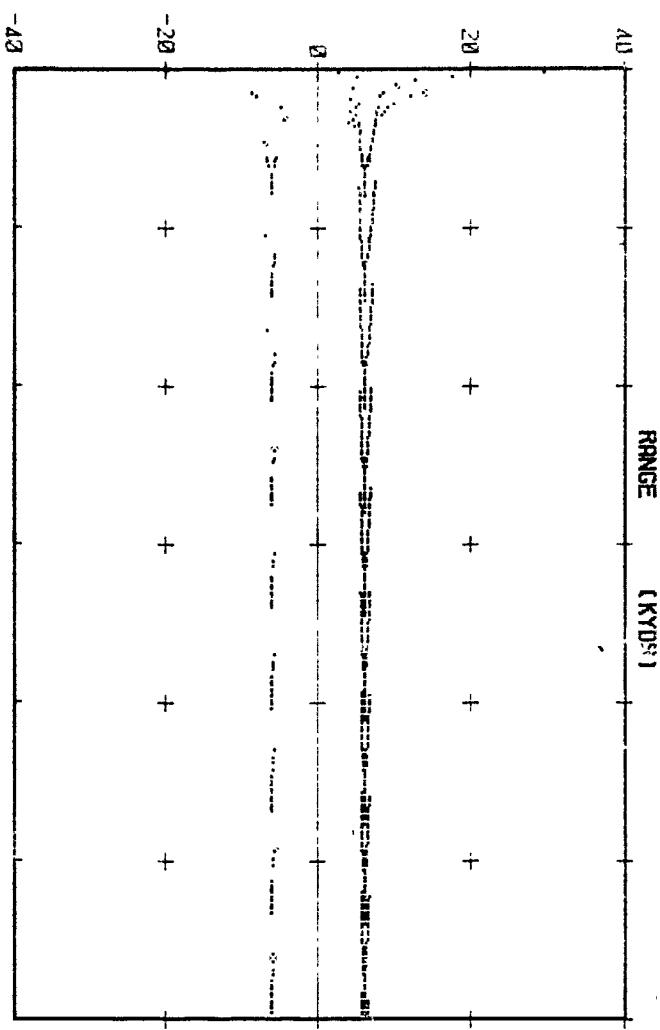
1450 M/S 1500 1550

LRAPP

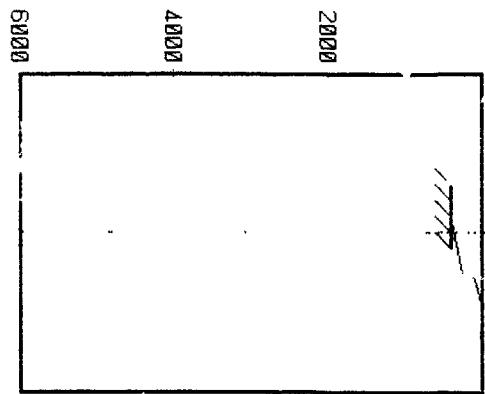
DB LOSS



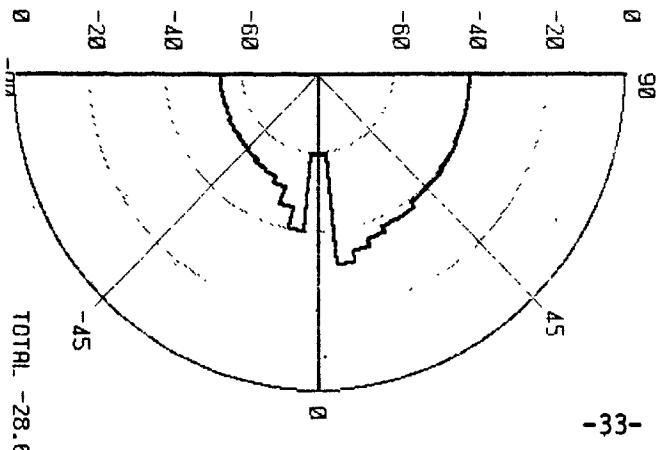
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



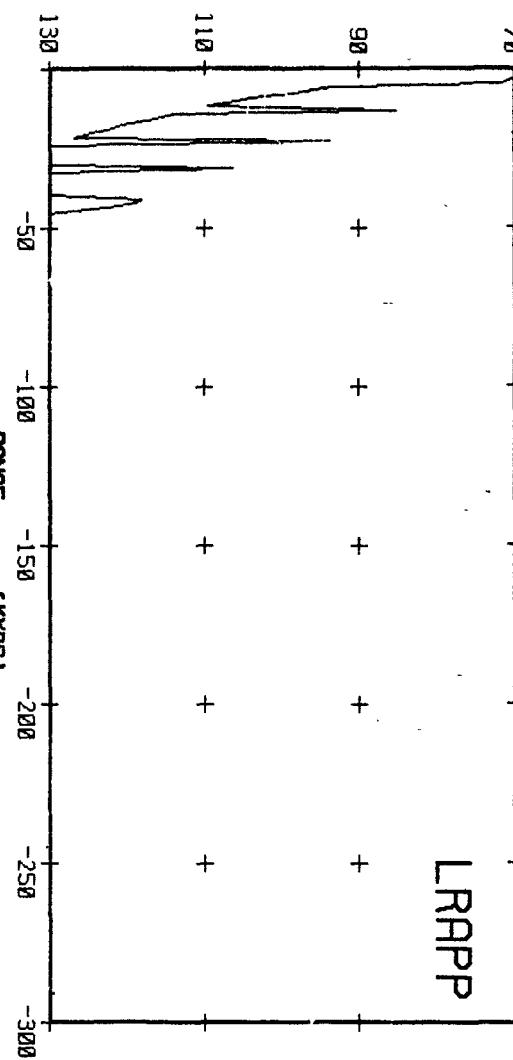
AREA 5 WINTER

S 20 R 1312 F 50

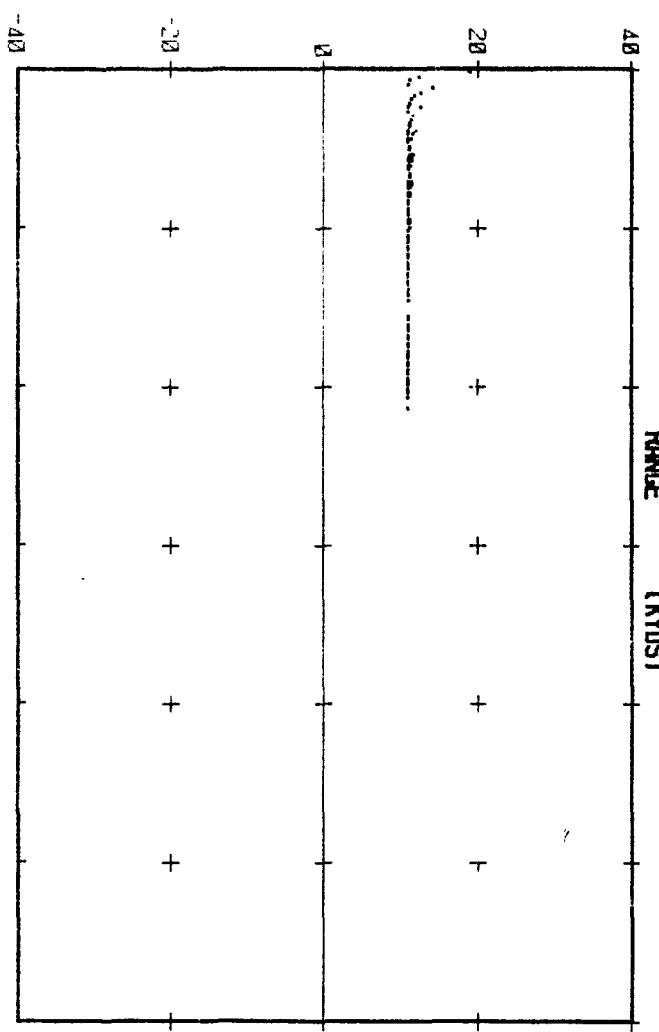
1450 M/S 1500 1550

LRAAPP

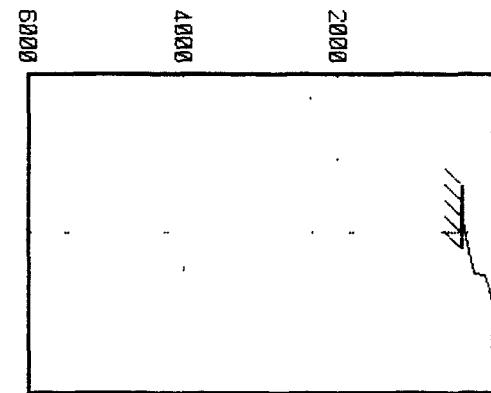
DB LOSS



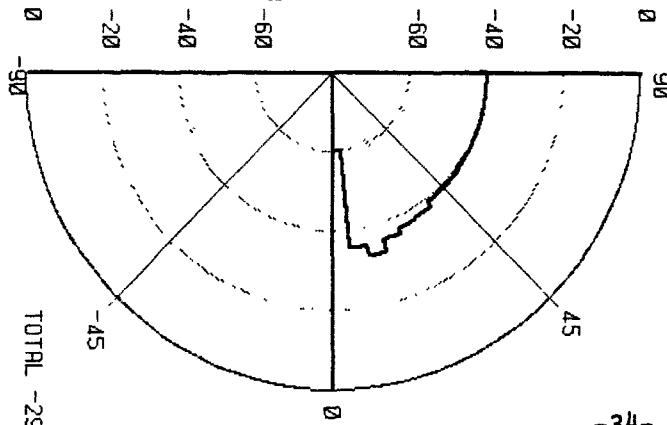
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)

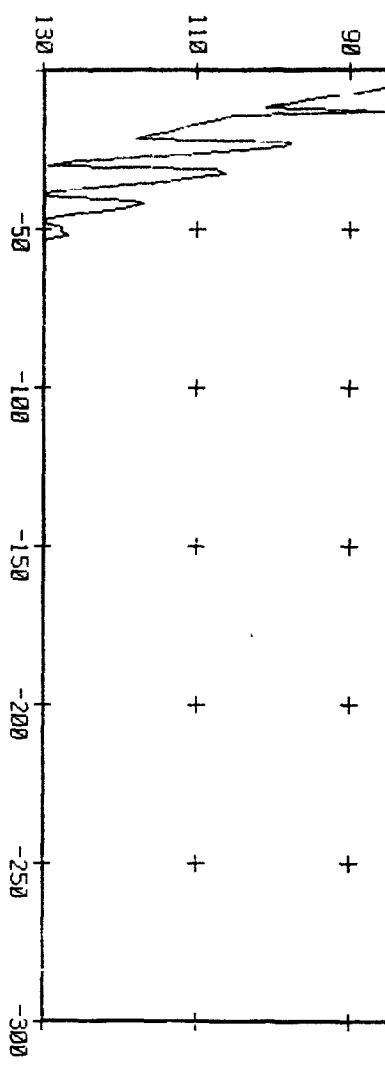


70
ARR 5 WINTER S 50 R 1312 F 50

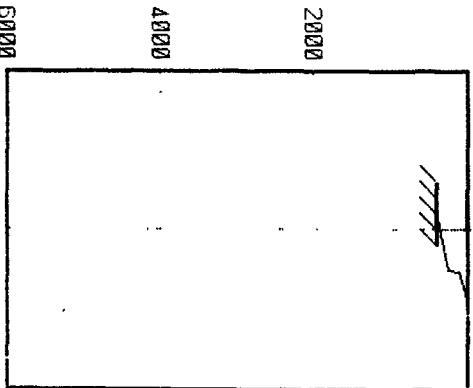
1450 M/S 1500 1550

L RAPP

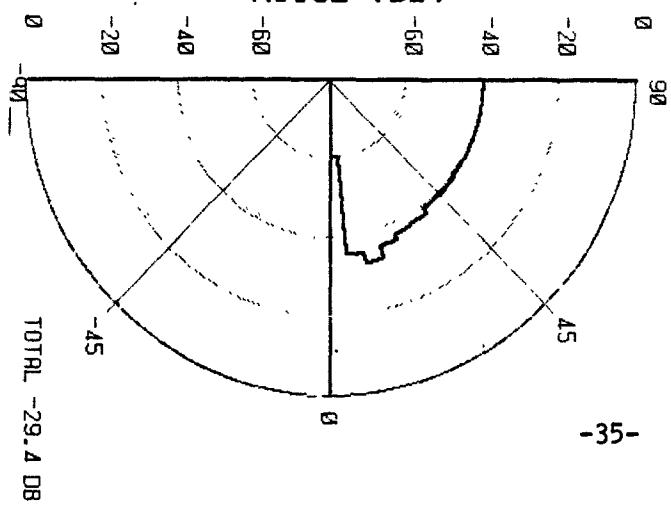
DB LOSS



DEPTH IN METERS



NOISE (DB)



-35-

TOTAL -29.4 DB

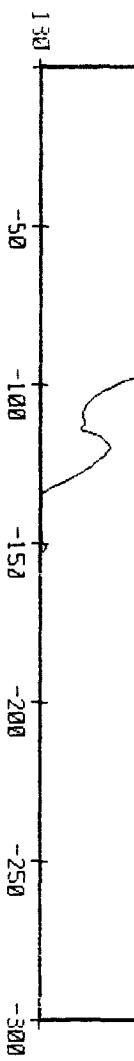
RIVER 5 WINTER

S 1020 R 1312 F 50

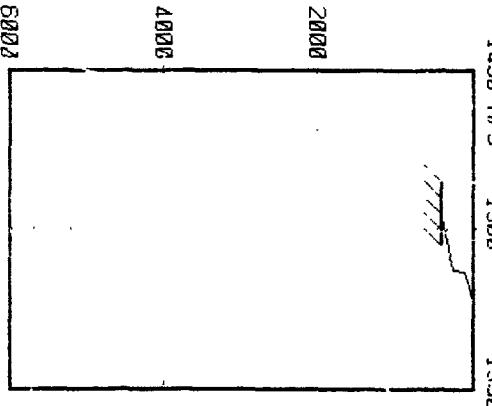
1450 M/S 1500 1550

LRAPP

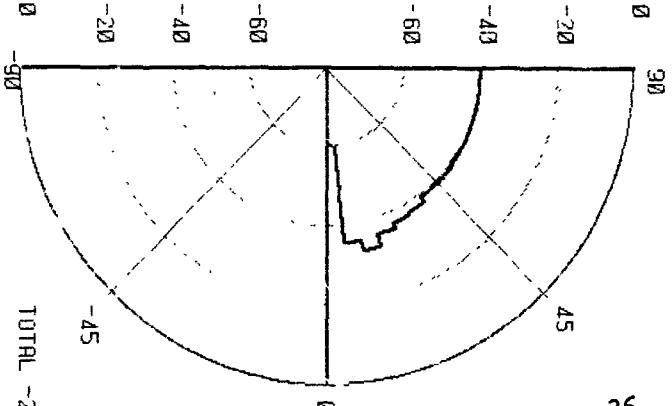
DB LOSS



DEPTH IN METERS



NOISE (DB)



TOTAL -29.4 DB

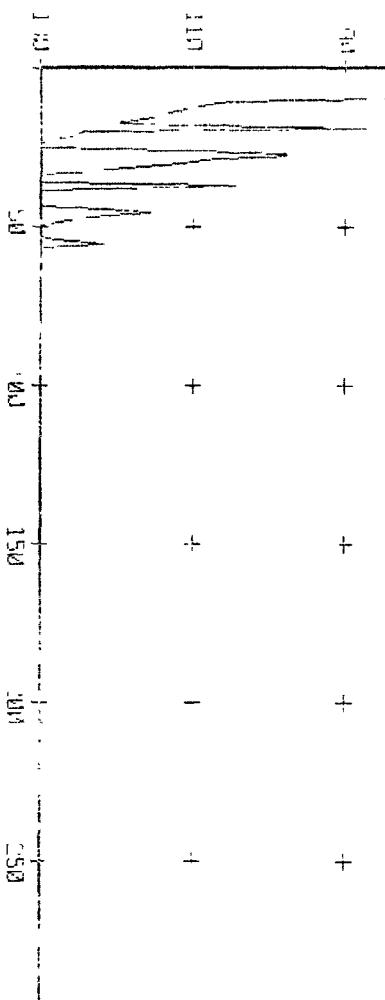
AREA 5 IN WATER

S 20 R 00 F 7E

1450 M/S 1520 1550

LRRPP

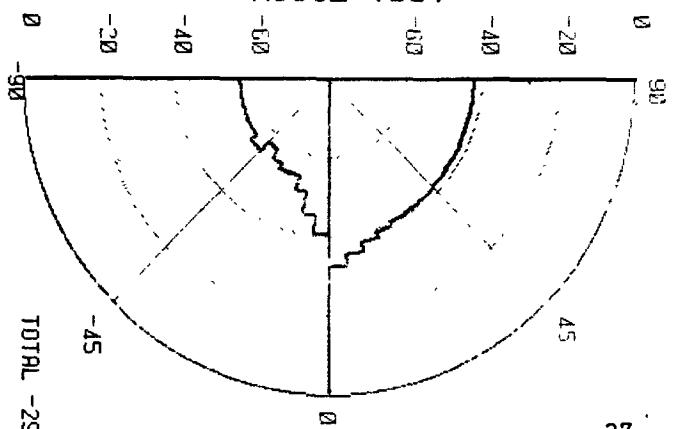
DB LOSS



DEPTH IN METERS

20000 40000 60000

NOISE (DB)



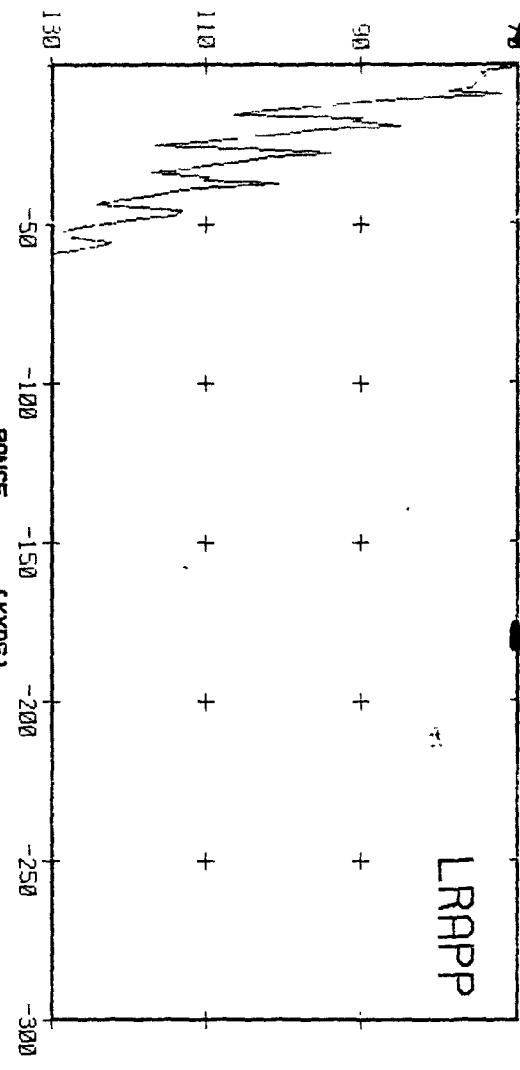
AREA 5 WINTER

50 R 60 F 70

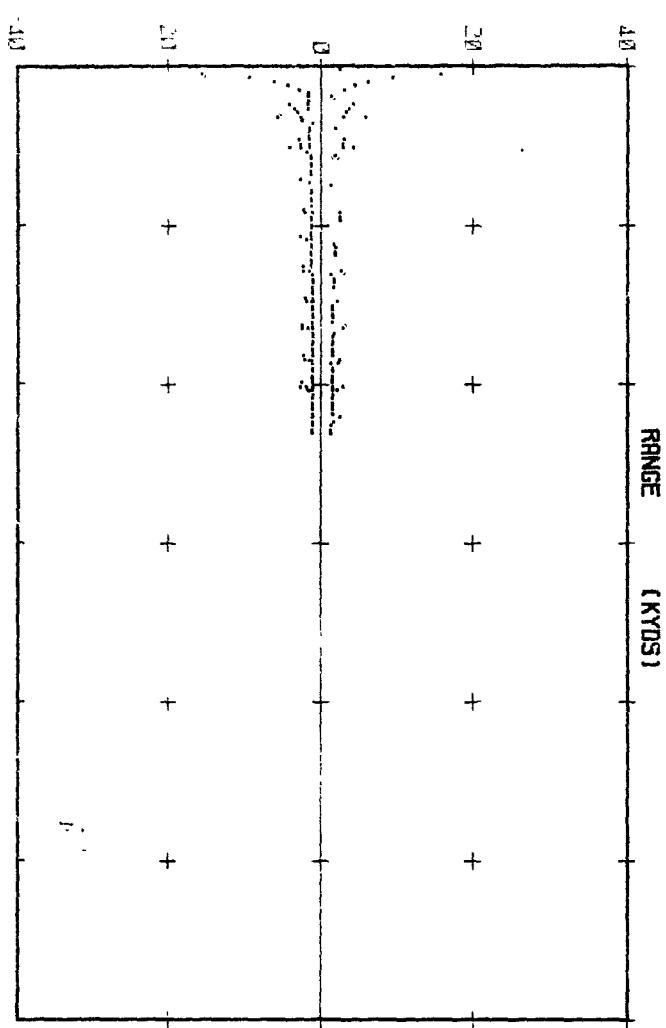
1450 M/S 1500 1550

L RAPP

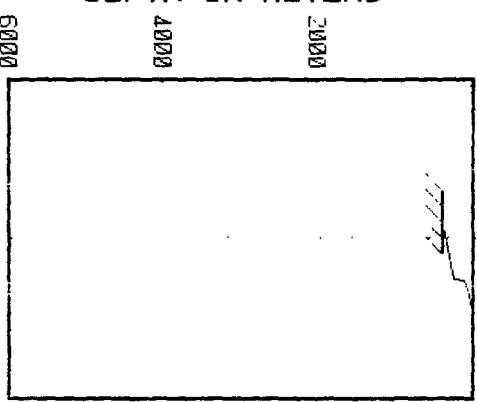
DB LOSS



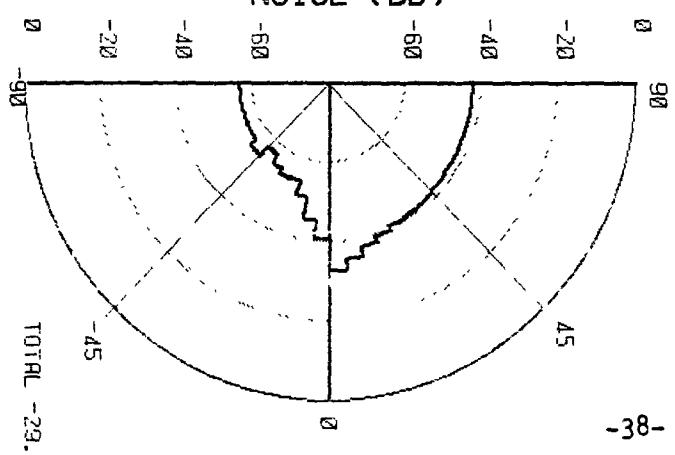
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -29.9 DB

70

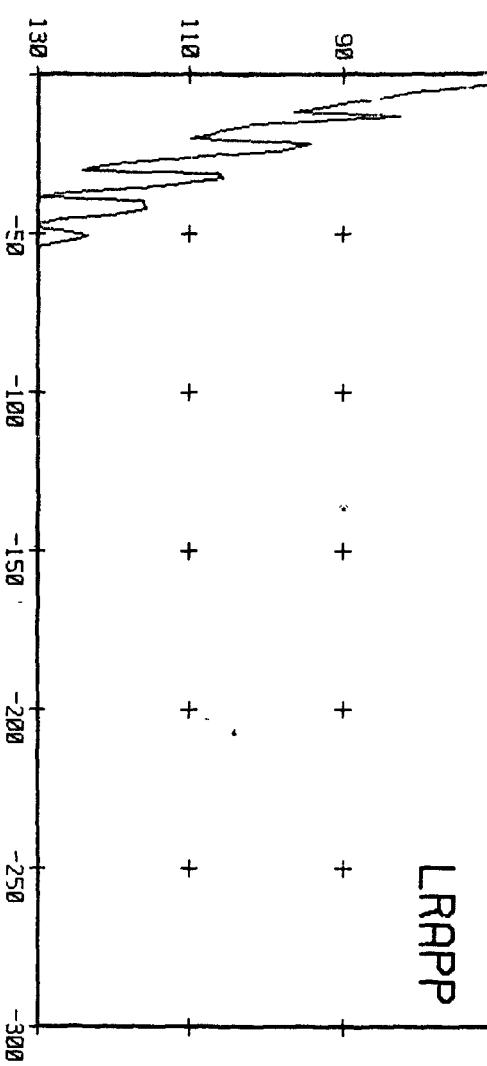
PRED 5 WINTER

S 1820 R 63 F 70

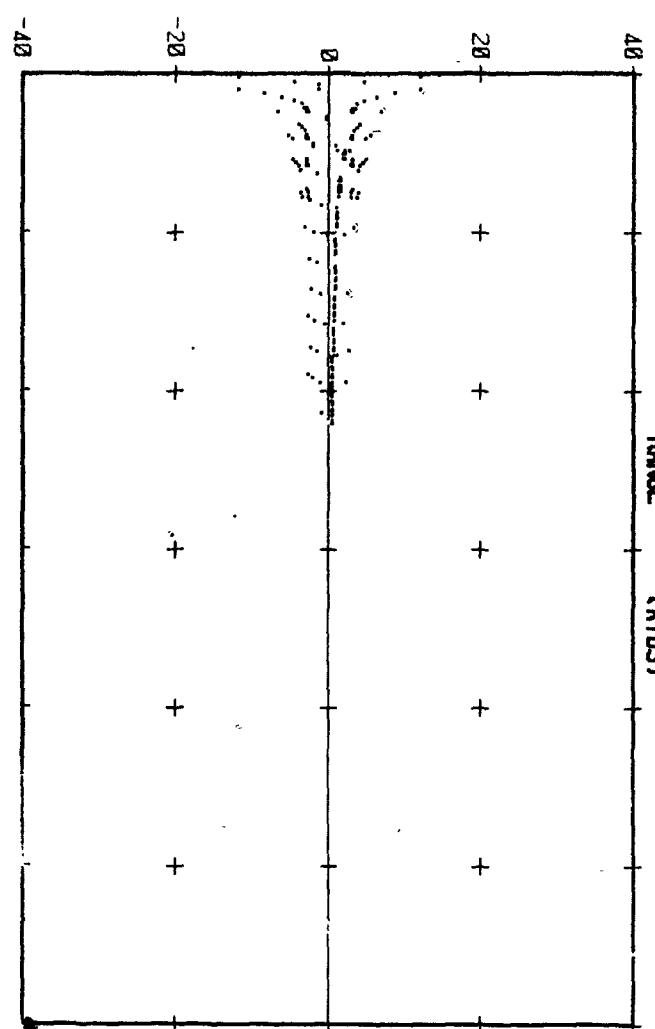
1450 M/S 1500 1550

LRAPP

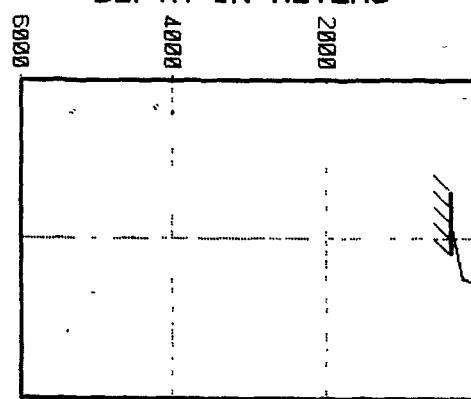
DB LOSS



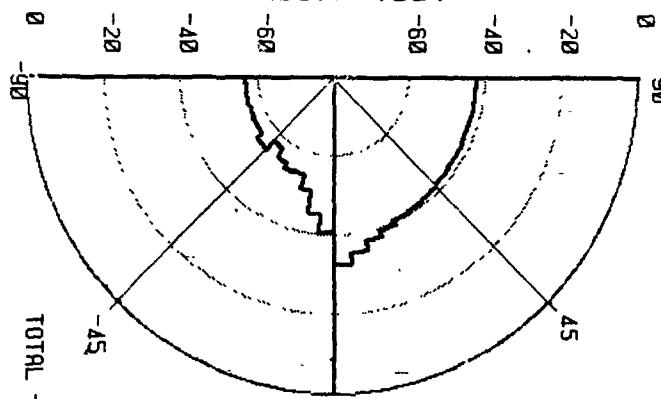
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



-39-

100

100

100

70

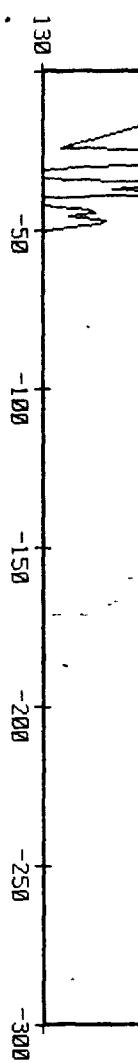
AREA 5 WINTER

S 20 R 300 F 70

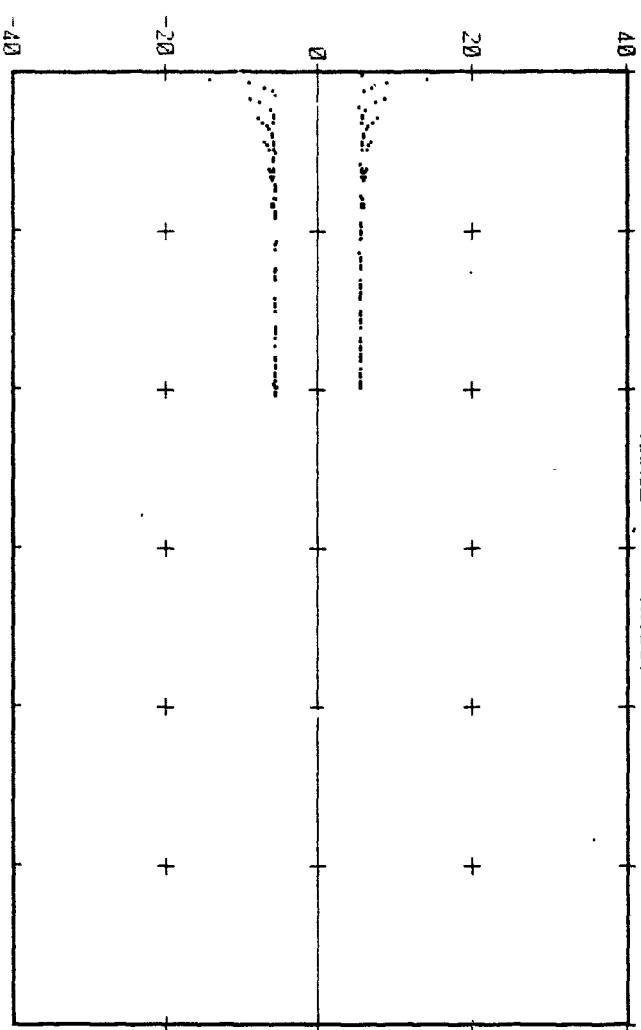
1450 M/S 1500 1550

LRAPP

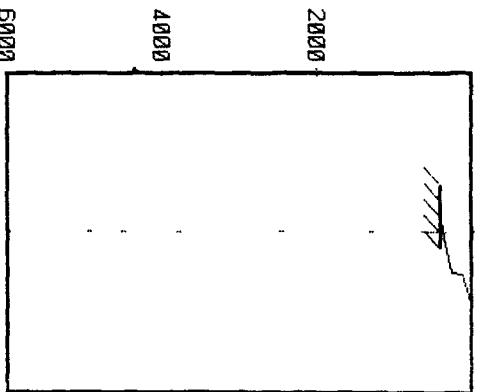
DB LOSS



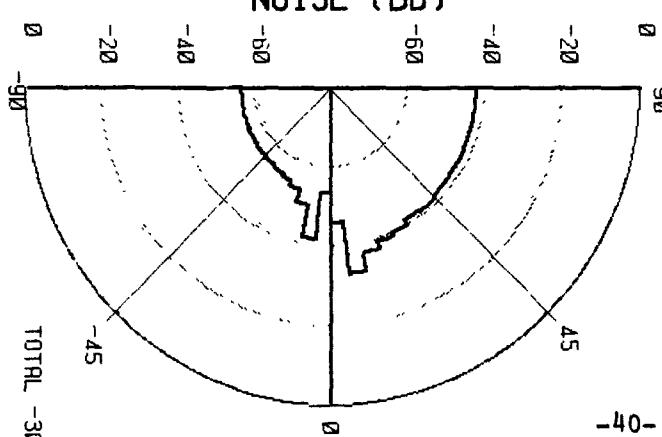
ARRIVAL ANGLE



DEPTH IN METERS

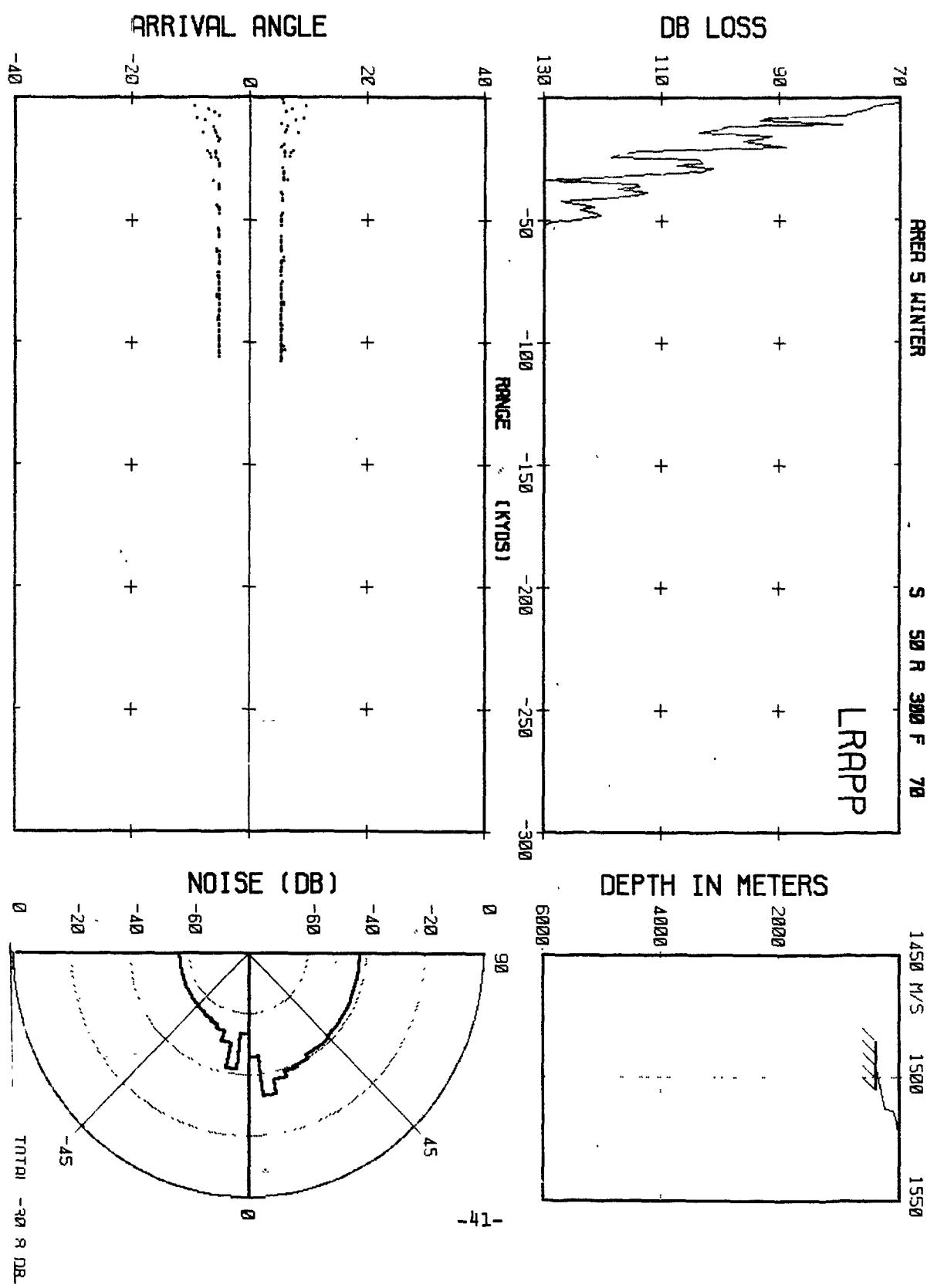


NOISE (DB)



-40-

TOTAL -30.8 DB



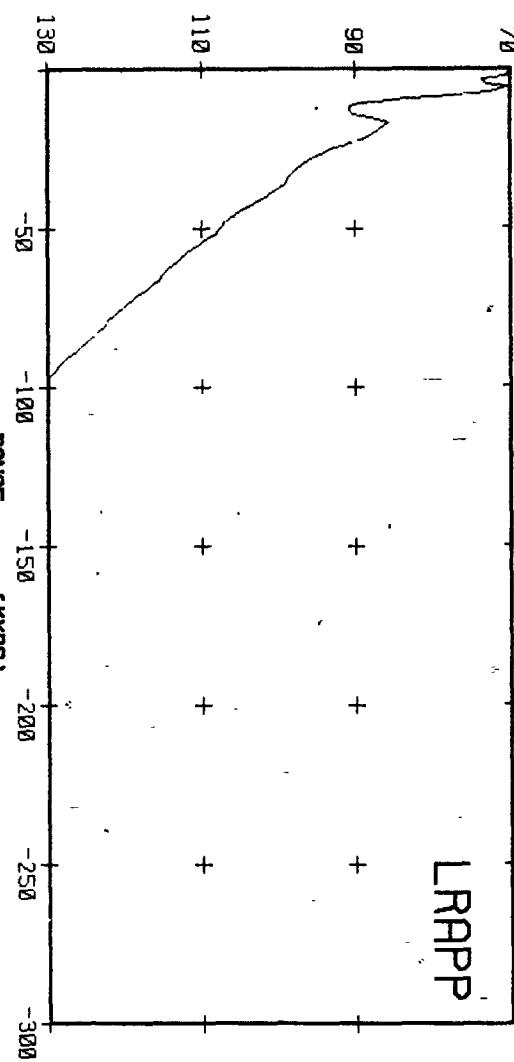
AREA 5 WINTER

S 1020 R 300 F 70

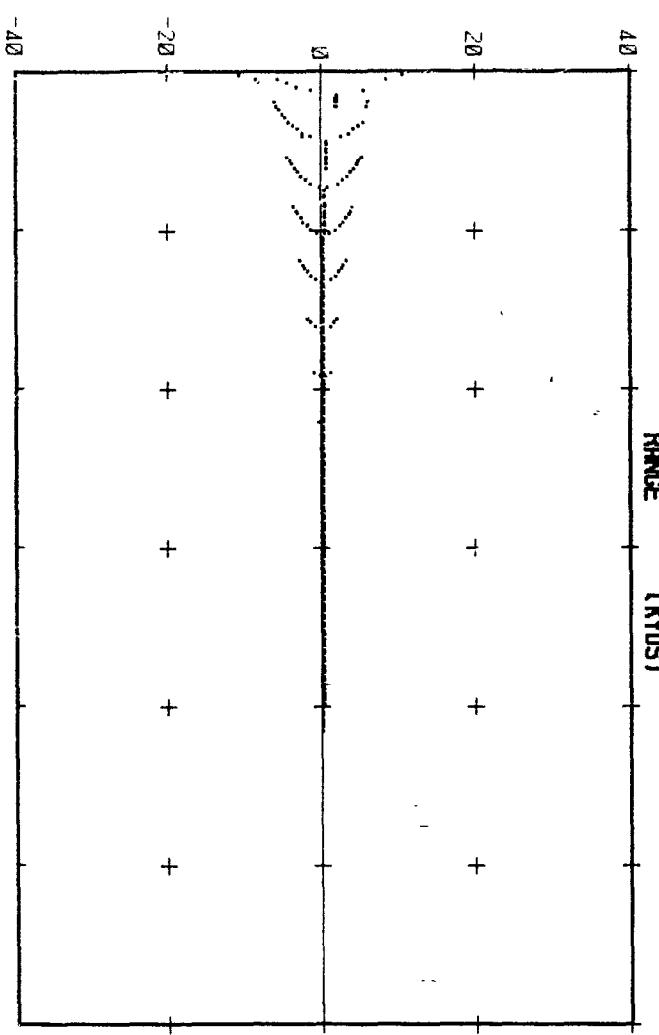
1450 M/S 1500 1550

LRAPP

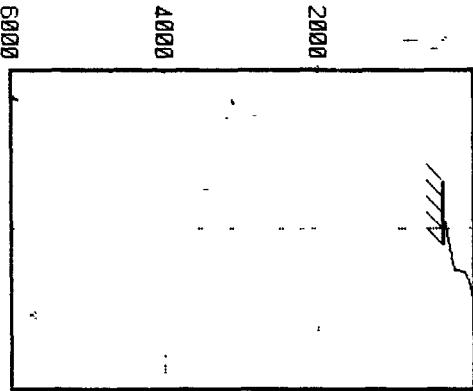
DB LOSS



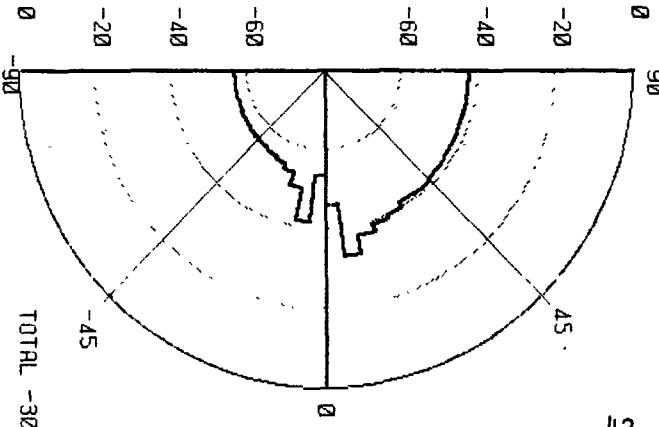
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



70

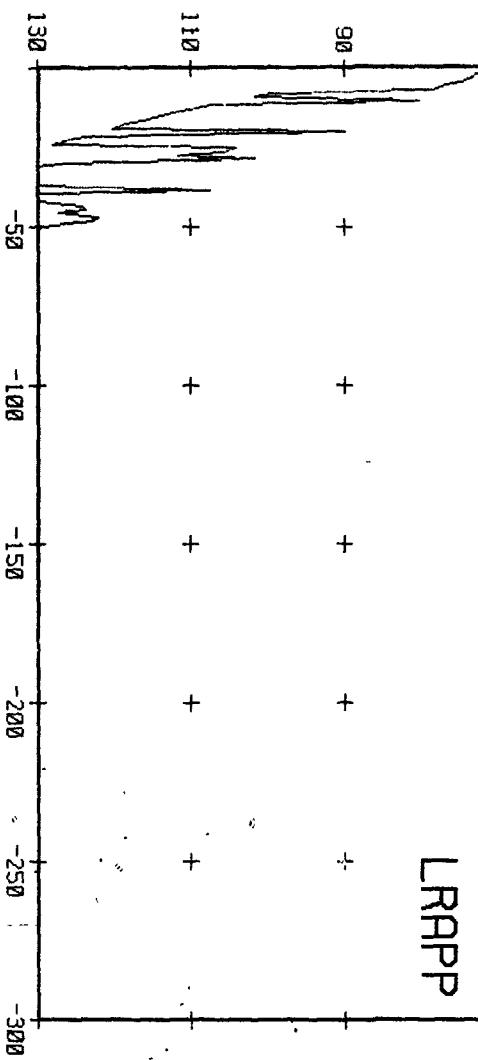
ARR 5 WINTER

S 20 R 328 F 70

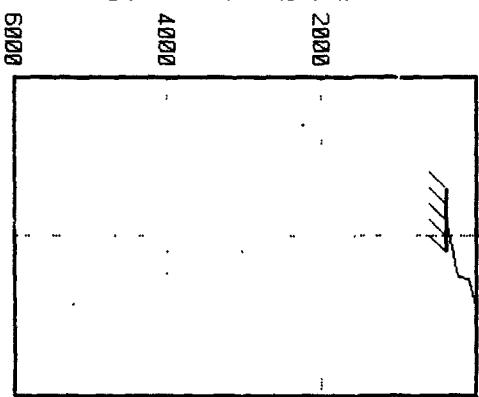
LRAPP

1450 M/S 1500 1550

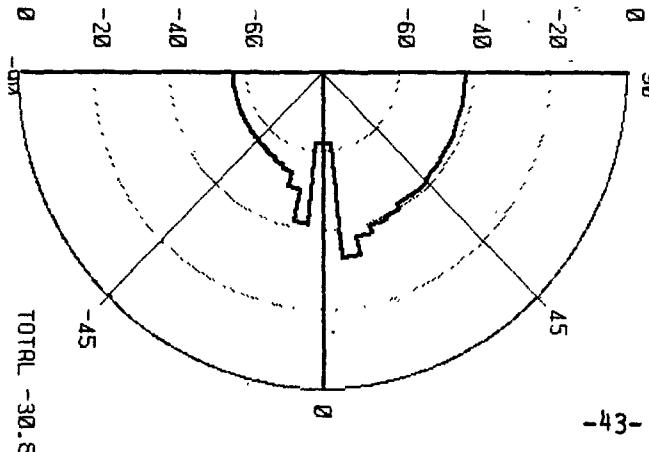
DB LOSS



DEPTH IN METERS

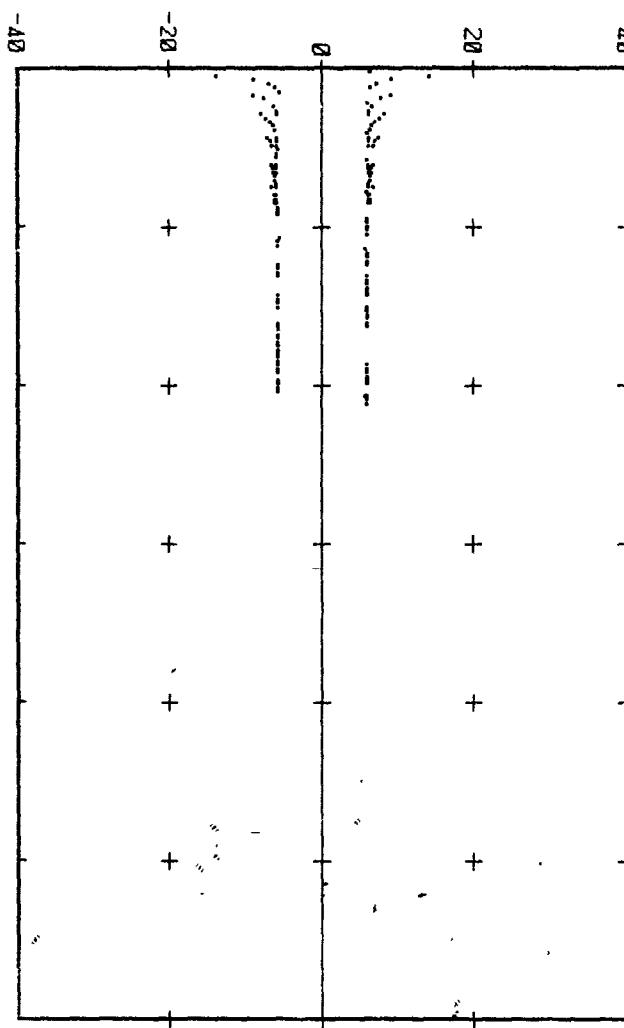


NOISE (DB)



-43-

ARRIVAL ANGLE



-40

TOTAL - 30.8 DB

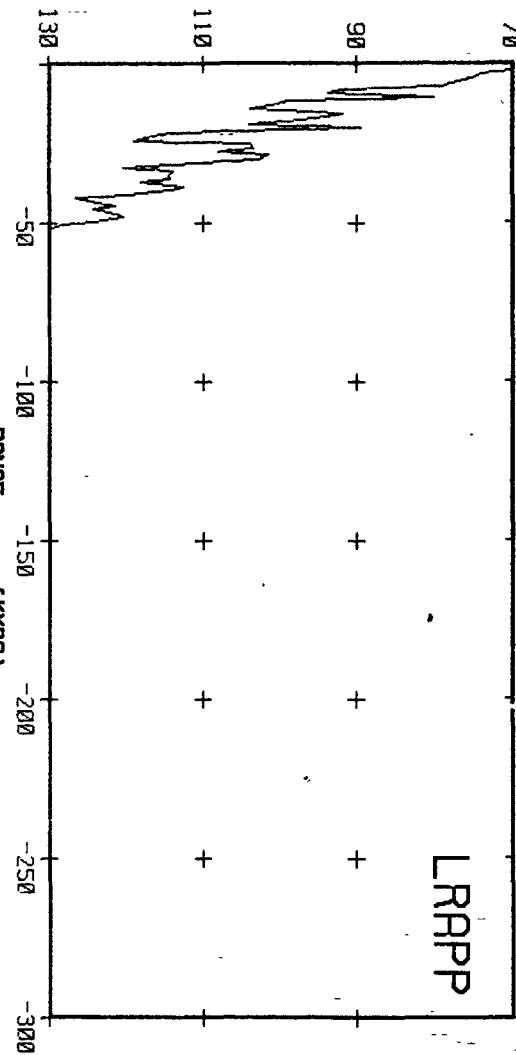
AREA 5 WINTER

S 50 R 328 F 78

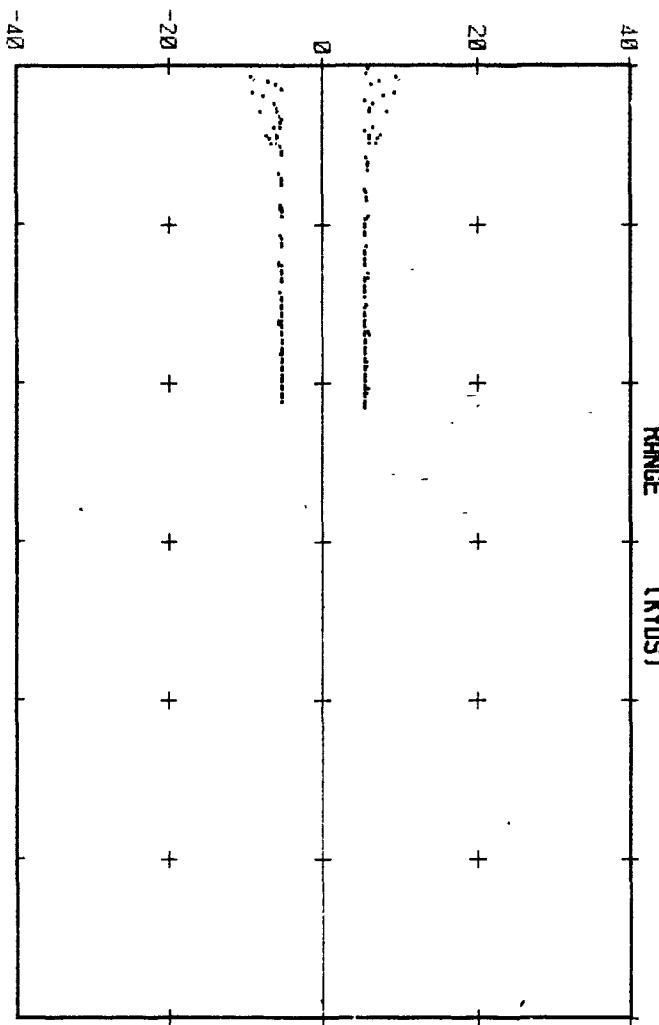
1450 M/S 1500 1550

LRAPP

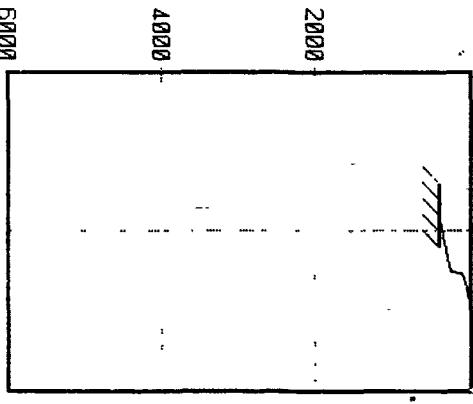
DB LOSS



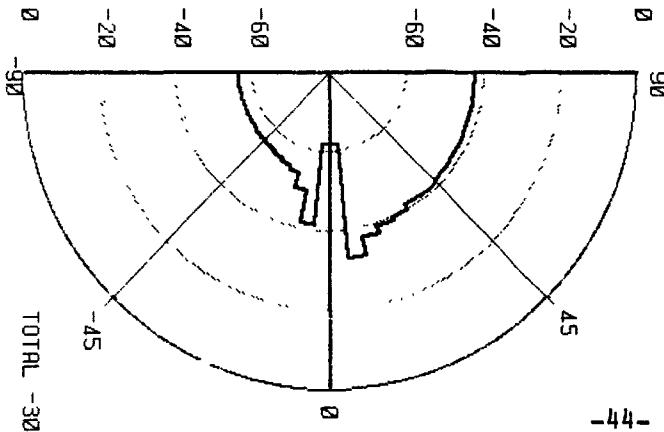
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



-44-

70

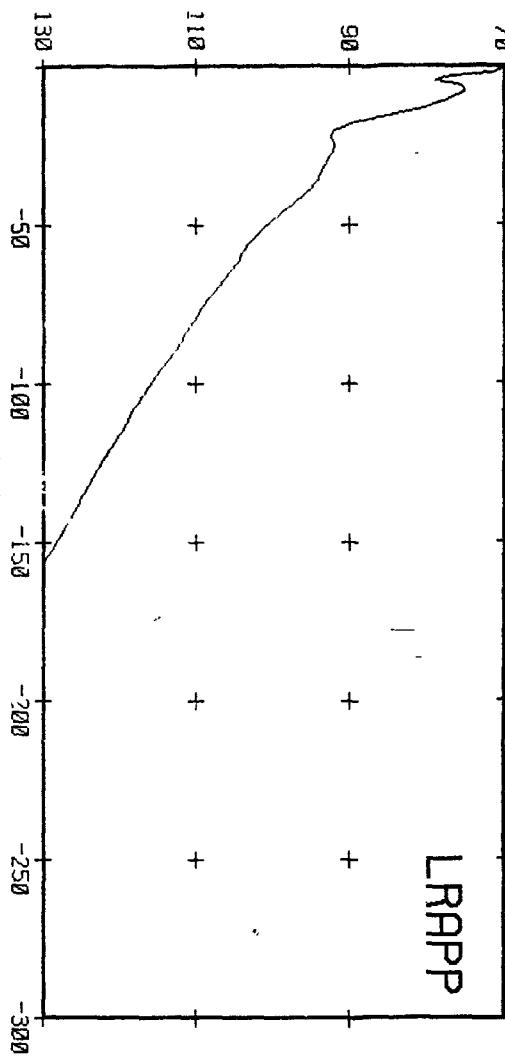
AREA 5 WINTER

S 1020 R 328 F 70

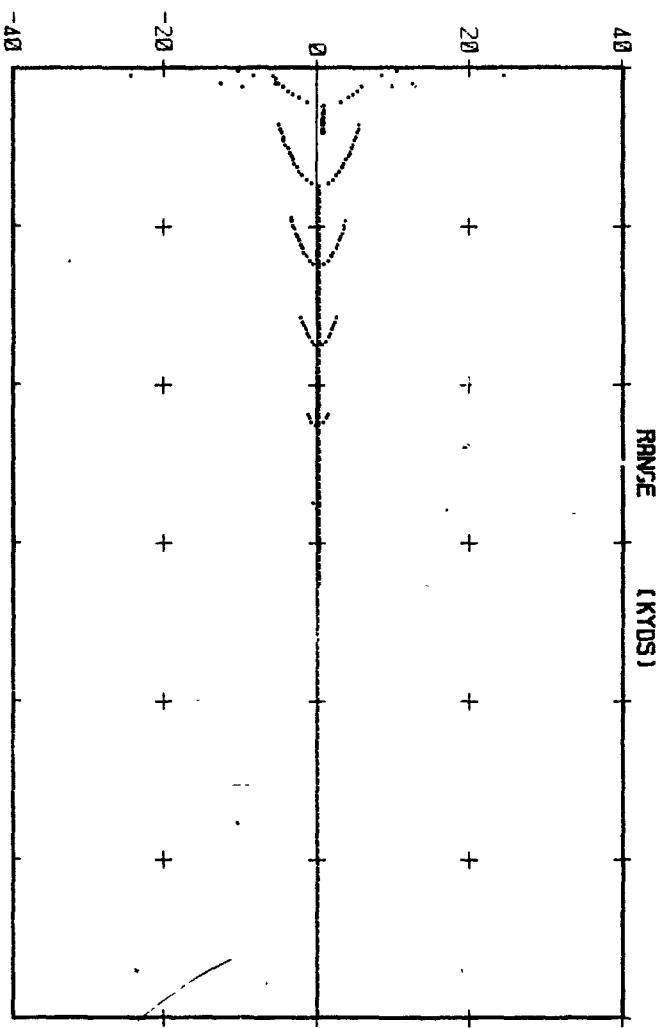
1450 M/S 1500 1550

LRAPP

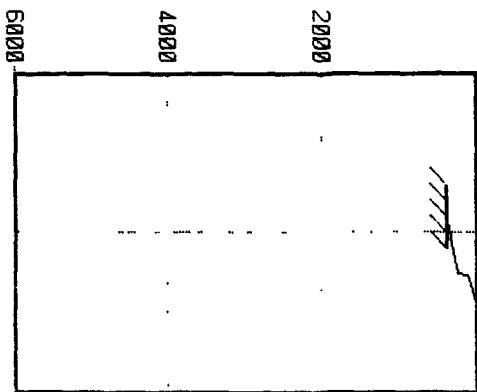
DB LOSS



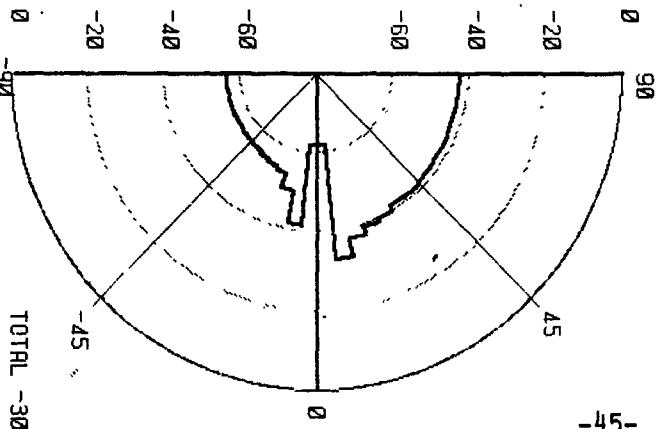
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -30.8 DB

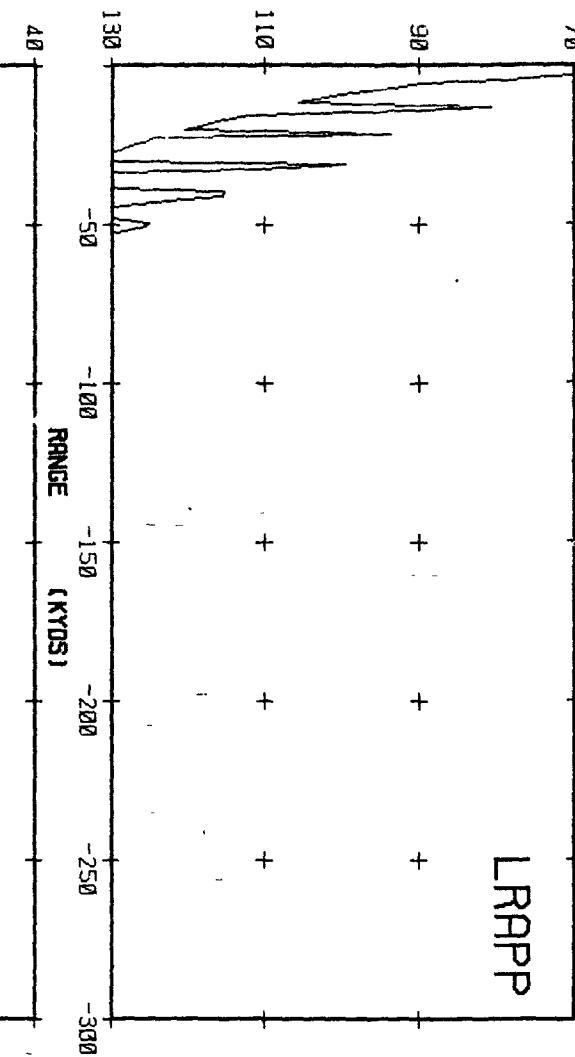
AREA 5 WINTER

S 20 R 920 F 70

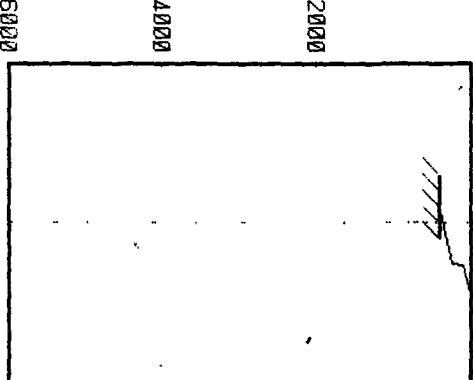
1450 M/S 1500 1550

LRAFP

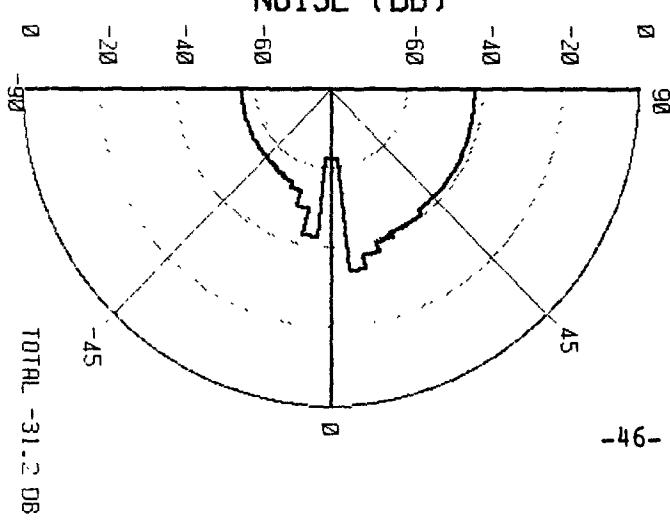
DB LOSS



DEPTH IN METERS



NOISE (DB)



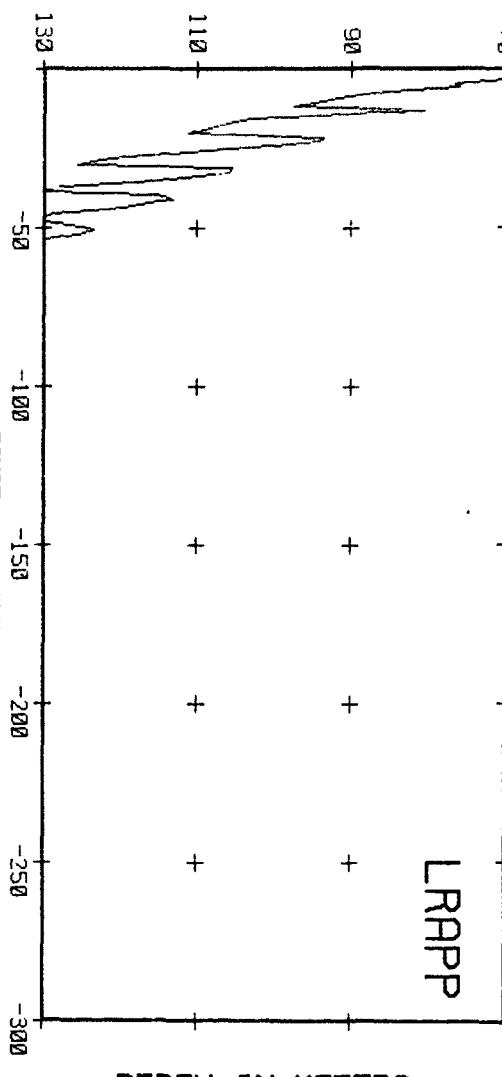
70

ARR 5 WINTER

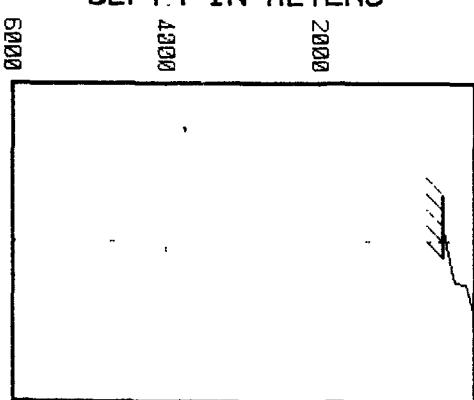
S 50 R 920 F 70

1450 M/S 1500 1550

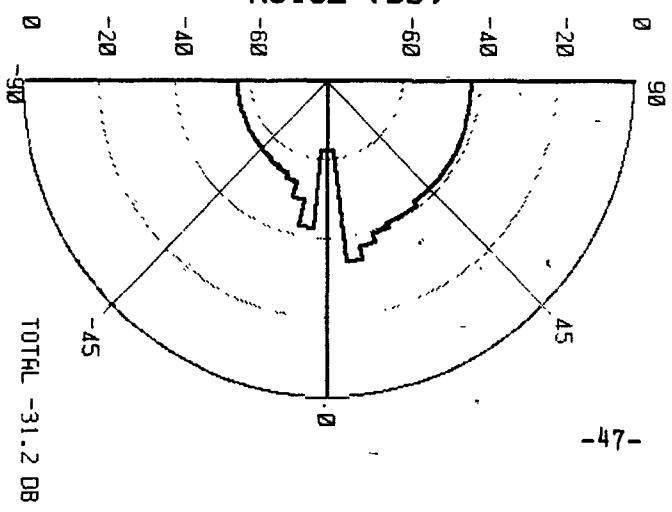
DB LOSS



DEPTH IN METERS



NOISE (DB)



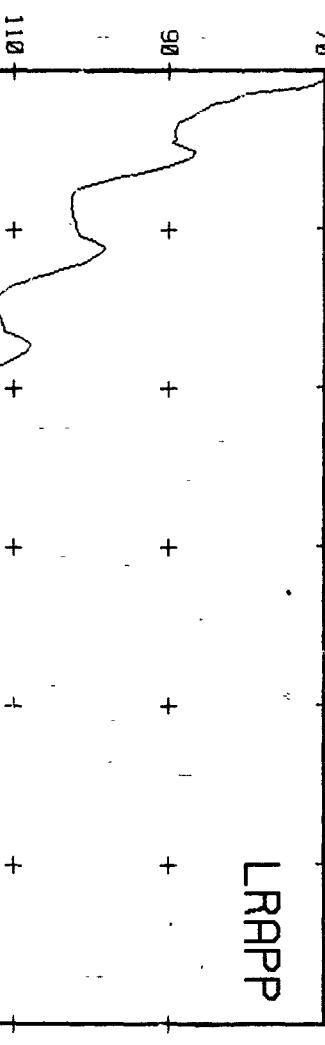
AREA 5 WINTER

S 1020 R 920 F 70

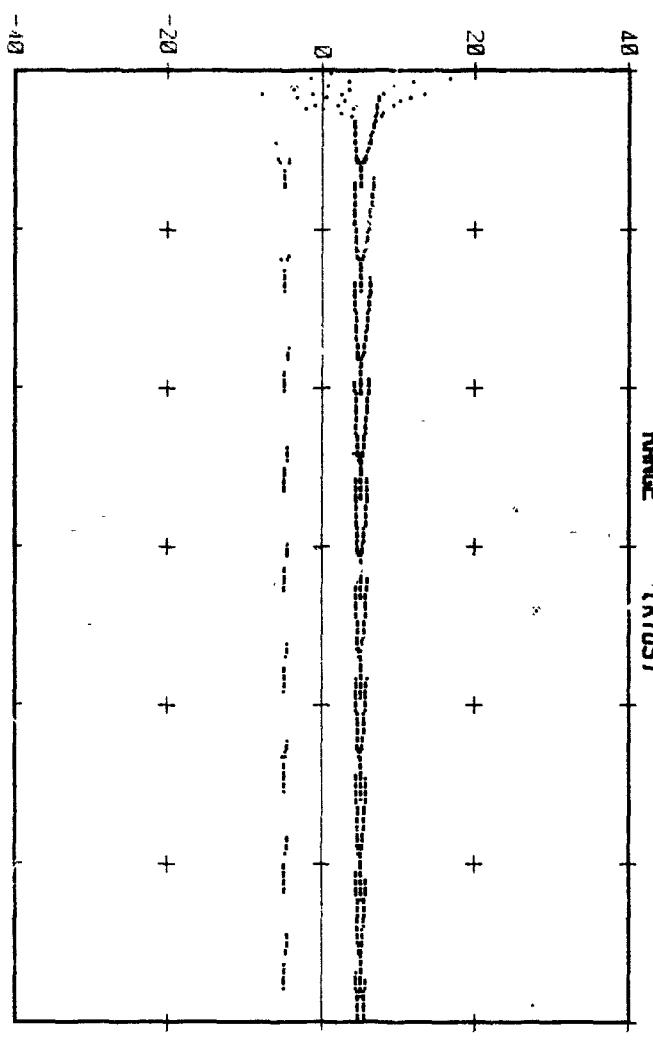
1450 M/S 1500 1550

LRAPP

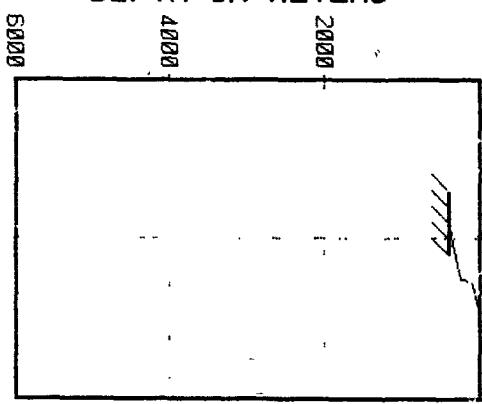
DB LOSS



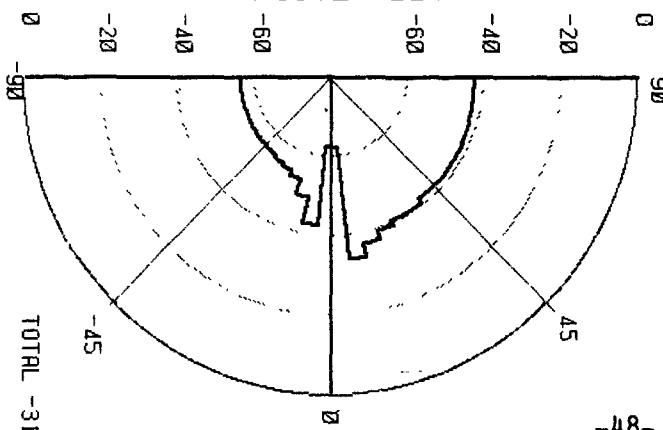
ARRIVAL ANGLE



DEPTH IN METERS



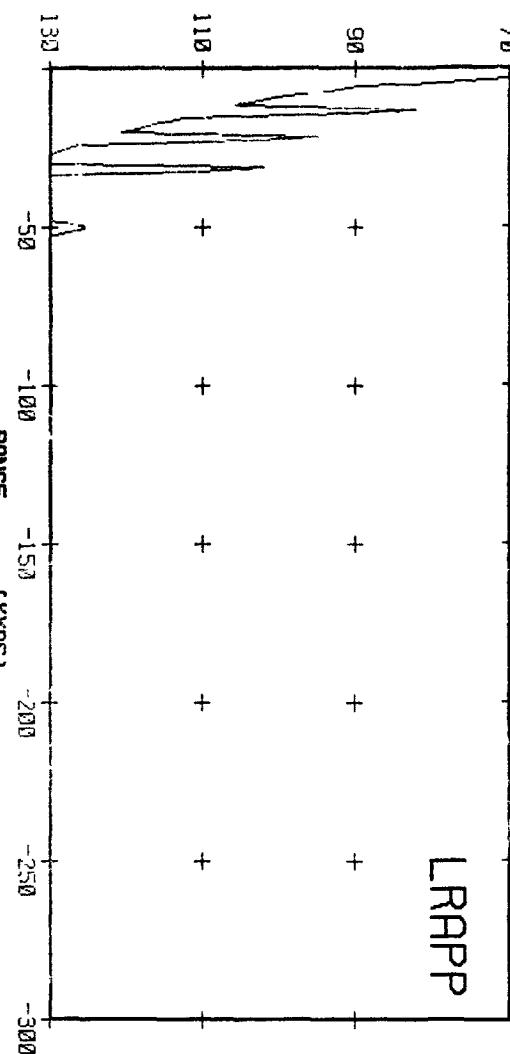
NOISE (DB)



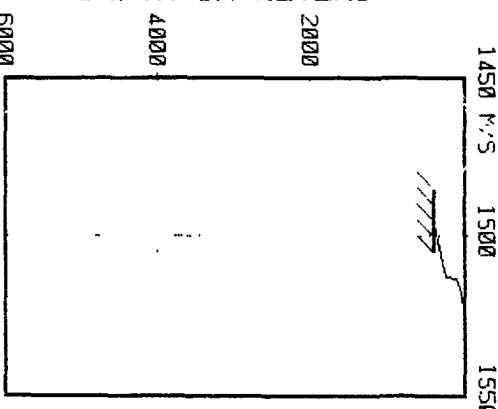
70 AREA 5 WINTER S 28 R 1800 F 70 1450 M/S 1500 1550

LRAPP

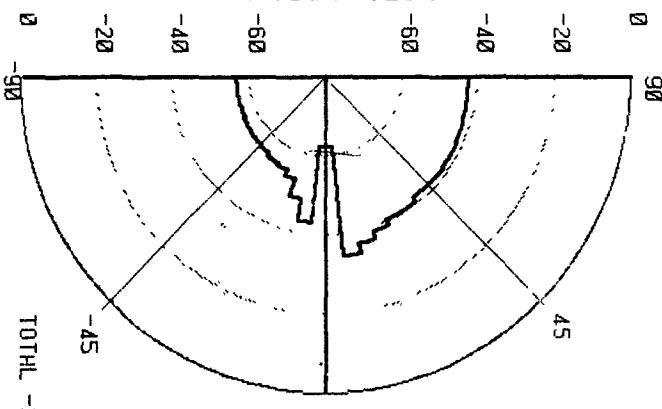
DB LOSS



DEPTH IN METERS



NOISE (DB)



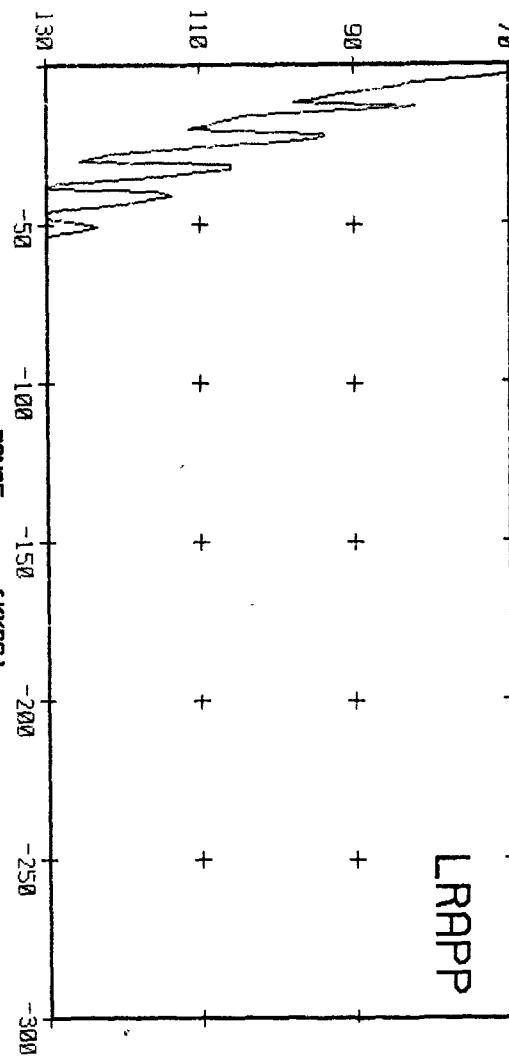
AREA 5 WINTER

S 50 R 1000 F 70

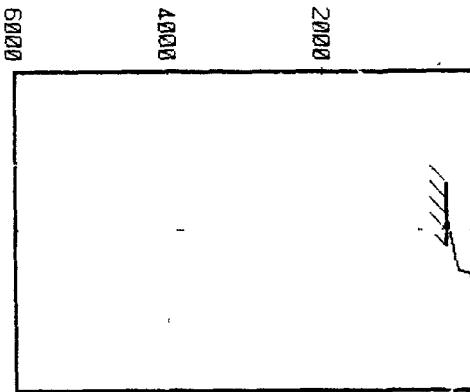
1450 M/S 1500 1550

LRAAPP

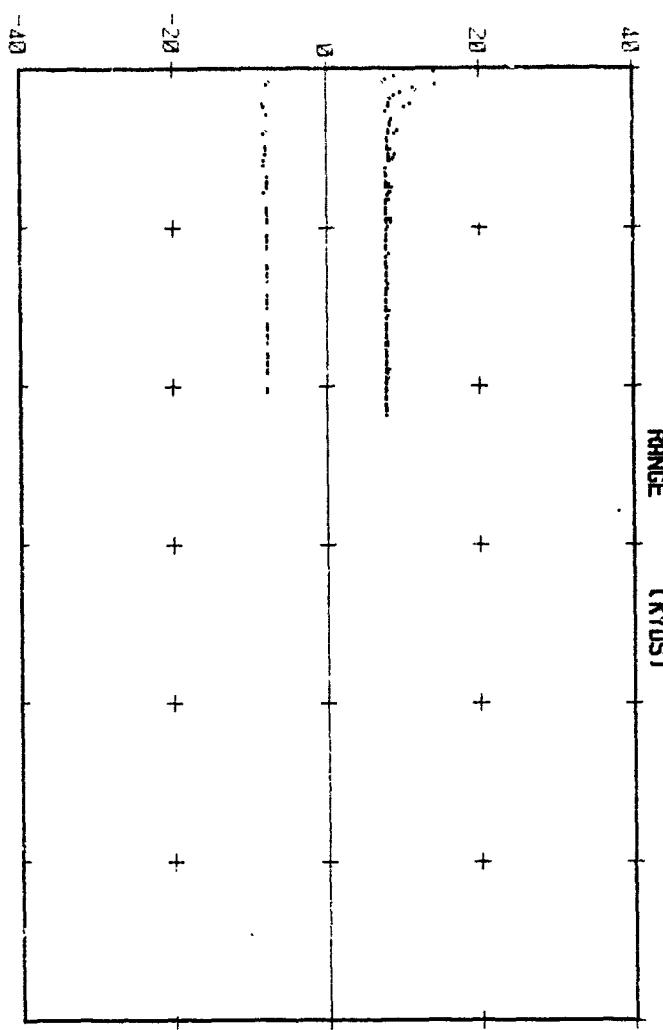
DB LOSS



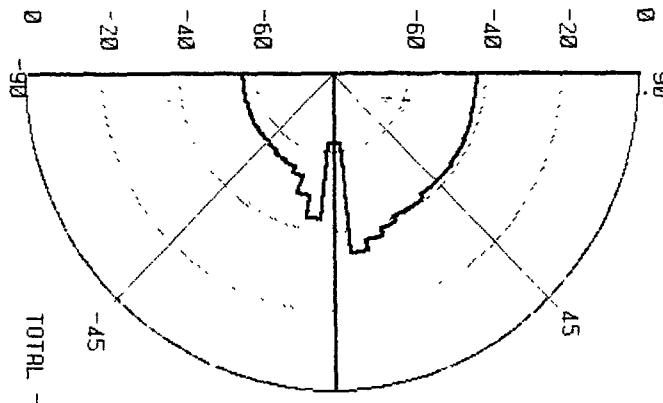
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



TOTAL -31.3 DB

AREA 5 WINTER

S 1020 R 1000 F 70

1450 M/S 1500 1550

LRAAPP

DB LOSS

90 + + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

130 + + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

ARRIVAL ANGLE

0 -50 -100 -150 -200 -250 -300

RANGE (KILOMETERS)

20 + + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

+ + + + +

DEPTH IN METERS

2000

4000

6000

8000

10000

12000

14000

16000

18000

20000

NOISE (DB)

-60

-40

-20

0

-20

-40

-60

-80

-100

-45

-30

-15

0

-15

-30

-45

-30

-15

0

-15

-30

-45

-60

1777

1778

1779

1780

1781

1782

1783

-51-

TOTAL -31.3 DB

70

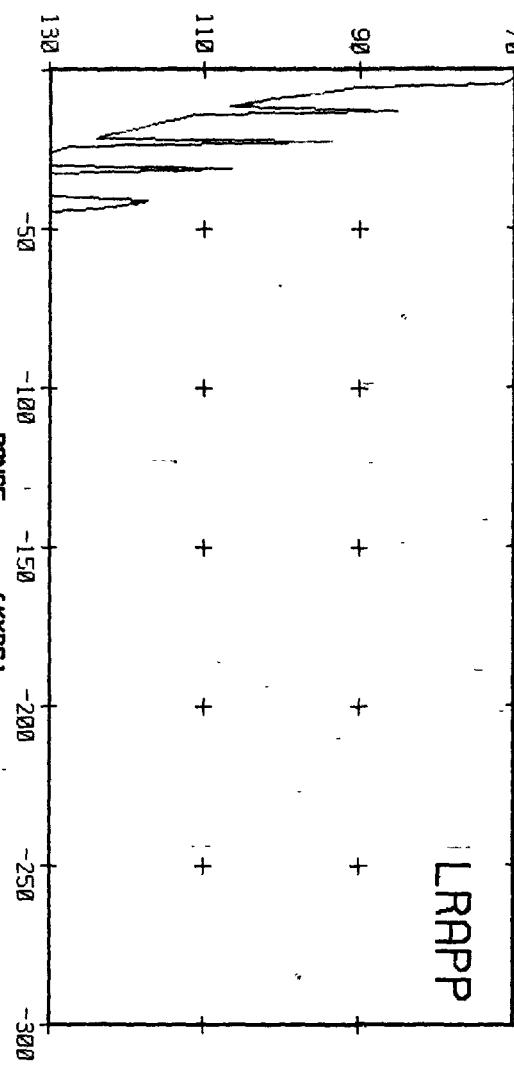
AREA 5 WINTER

S 28 R 1312 F 70

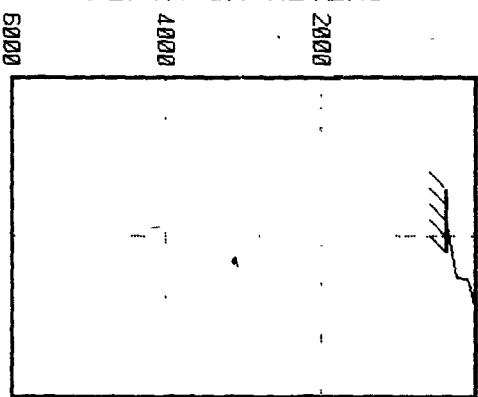
1450 M/S 1500 1550

LRAPP

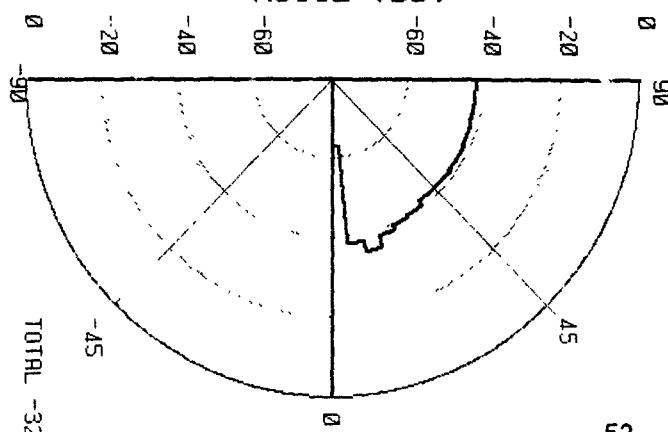
DB LOSS



DEPTH IN METERS



NOISE (DB)



TOTAL -32.1 DB

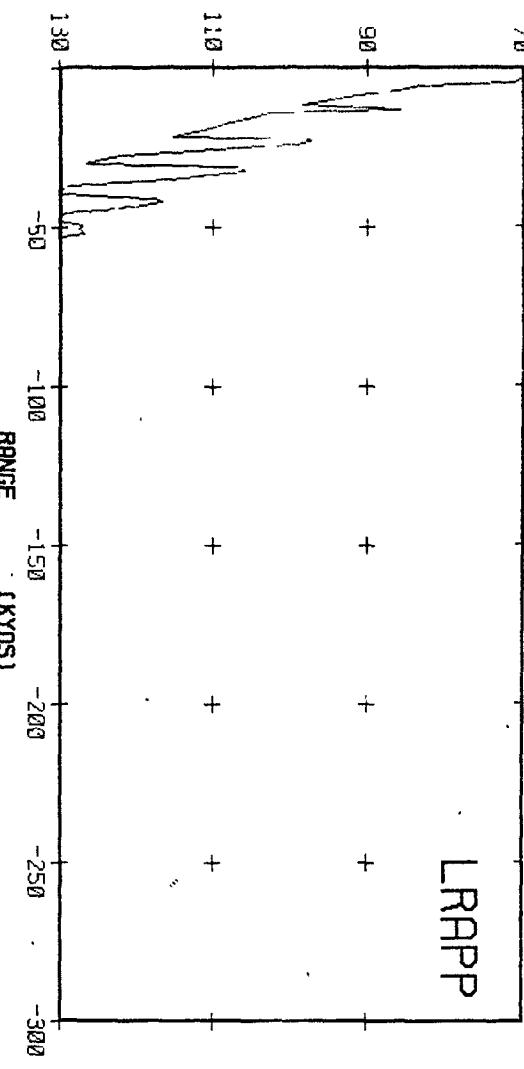
ARR 5 WINTER

S 50 R 1312 F 70

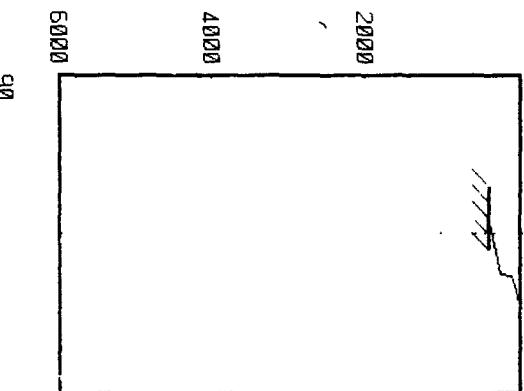
1450 M/S 1500 1550

LRAAPP

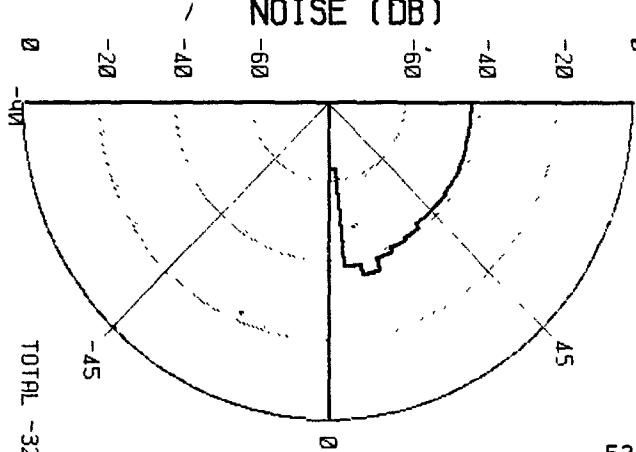
DB LOSS



DEPTH IN METERS



NOISE (DB)



TOTAL -32.1 DB

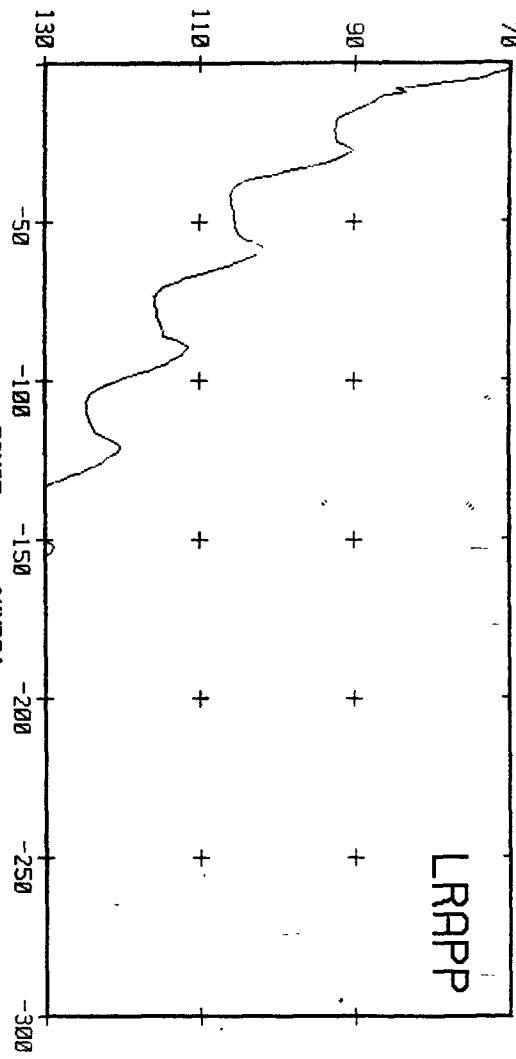
ARR 5 WINTER

S 1020 R 1312 F 70

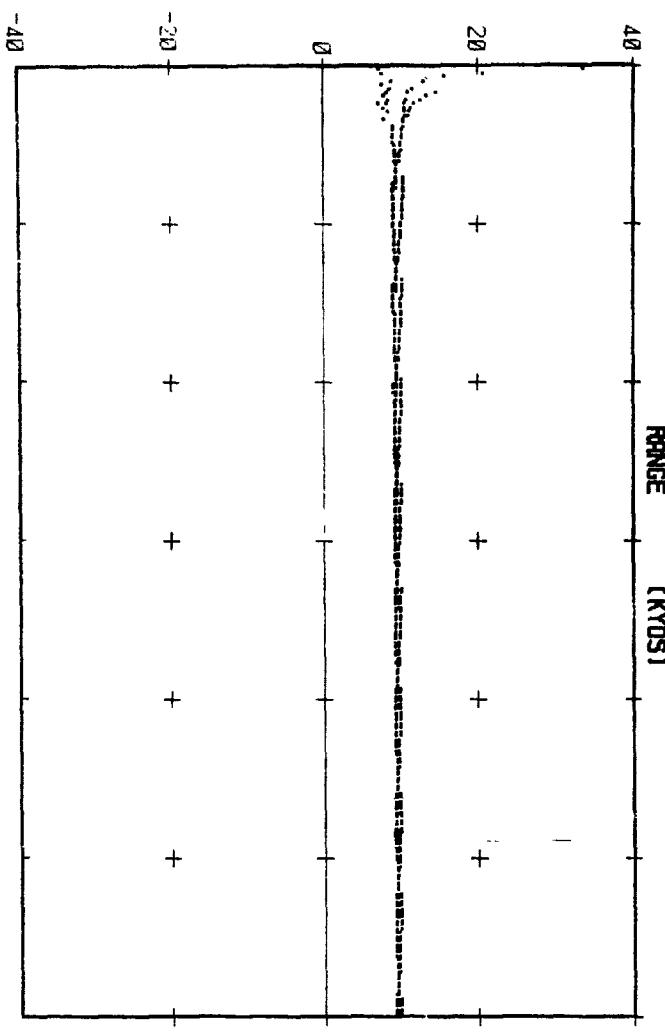
1450 M/S 1500 1550

LRRAPP

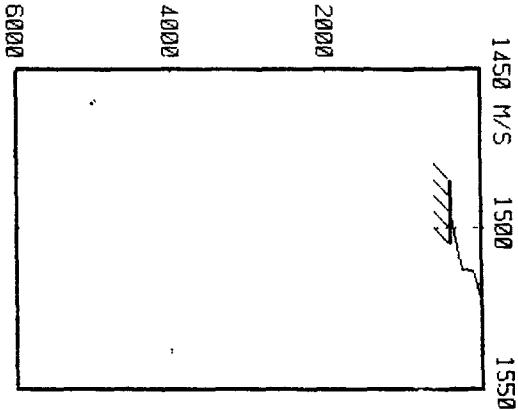
DB LOSS



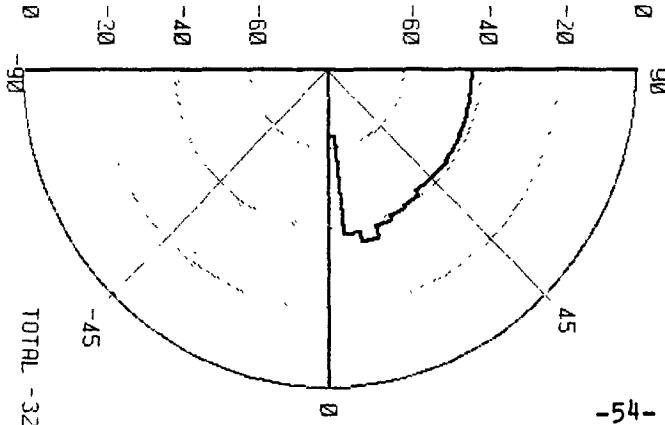
ARRIVAL ANGLE

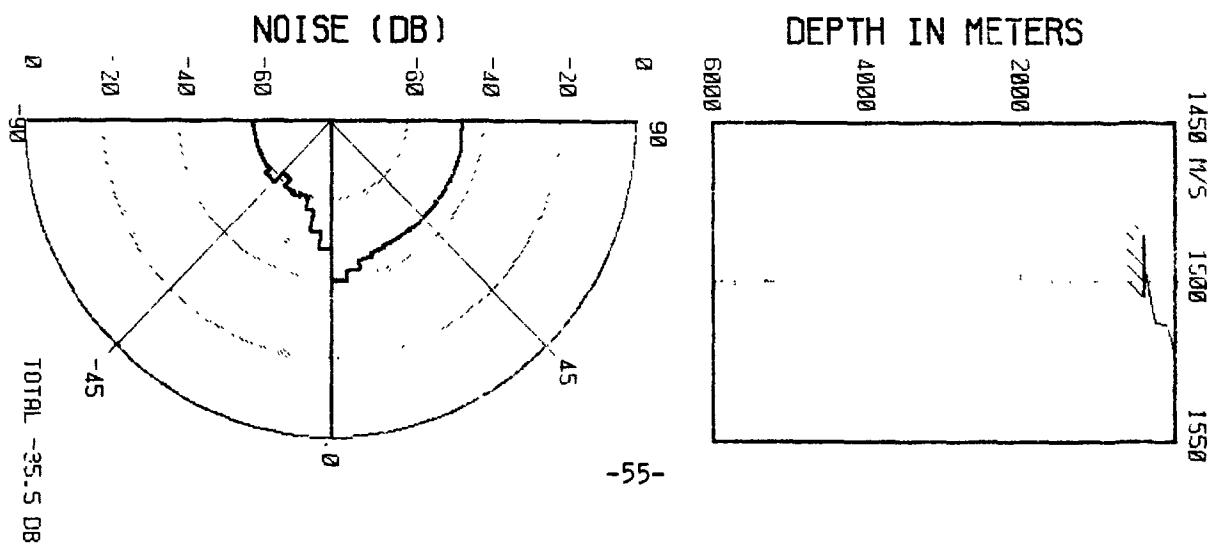
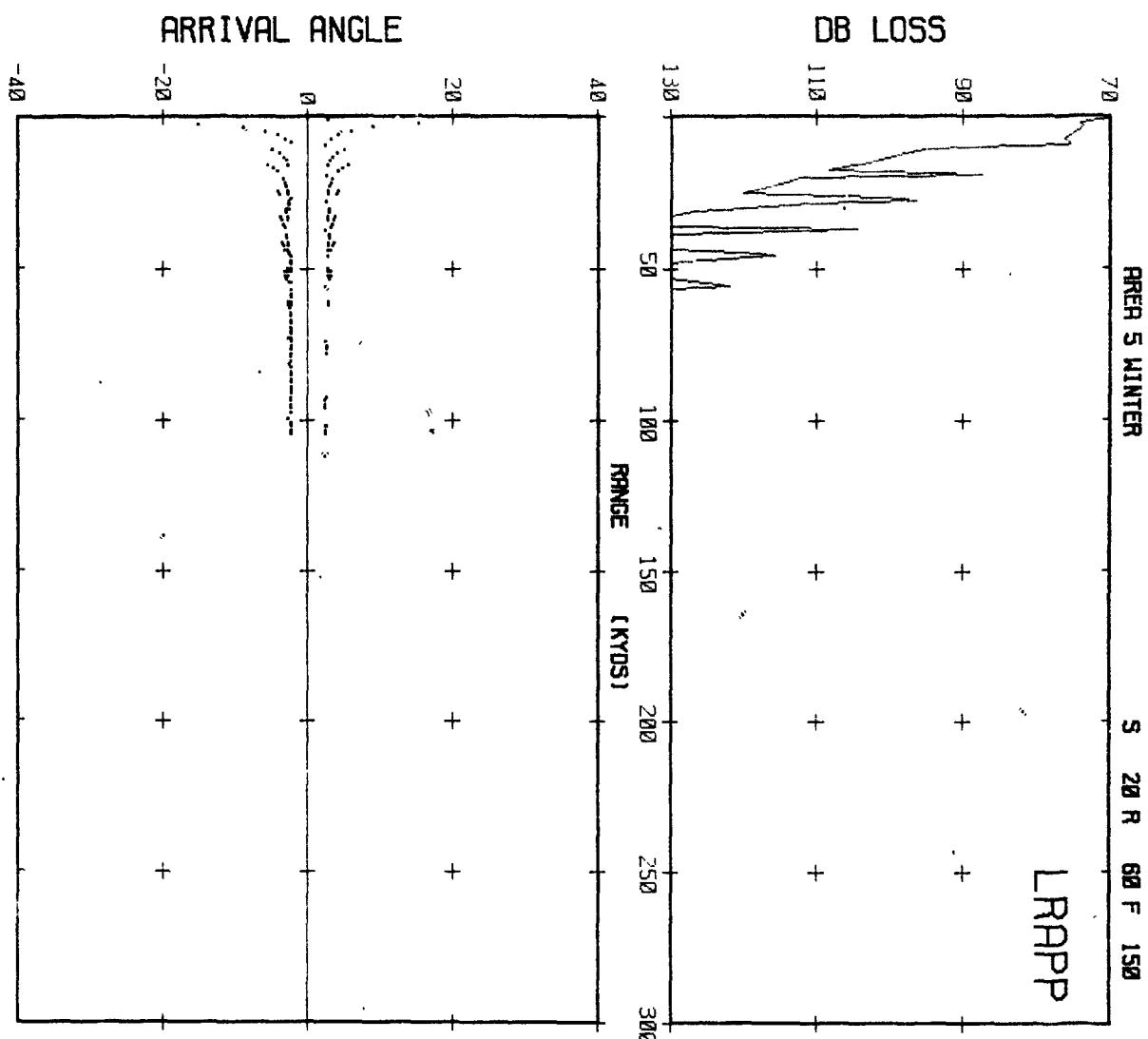


DEPTH IN METERS

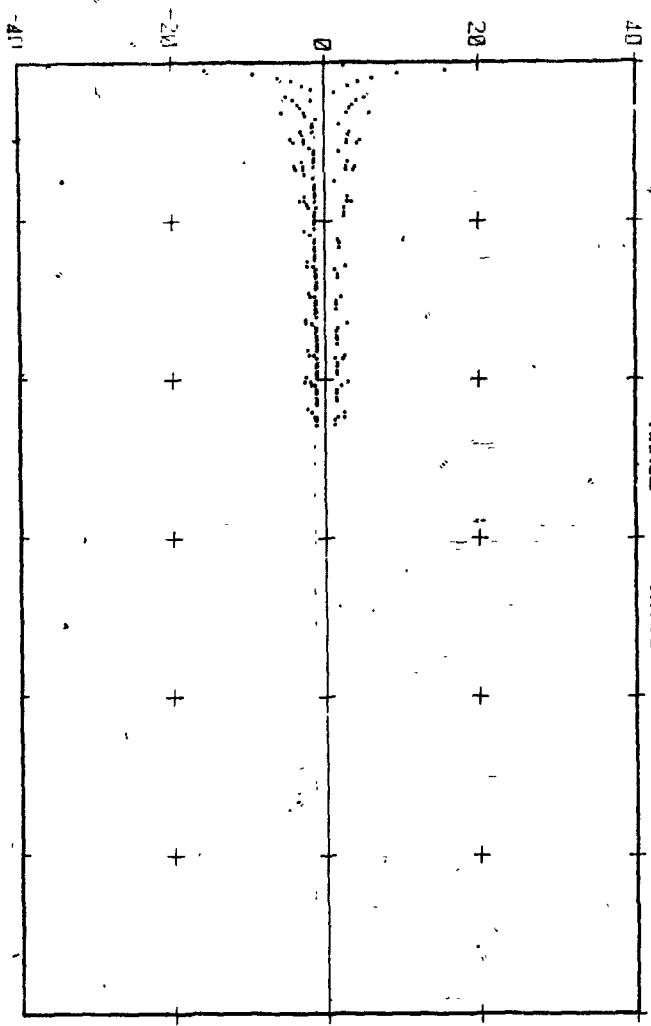


NOISE (DB)

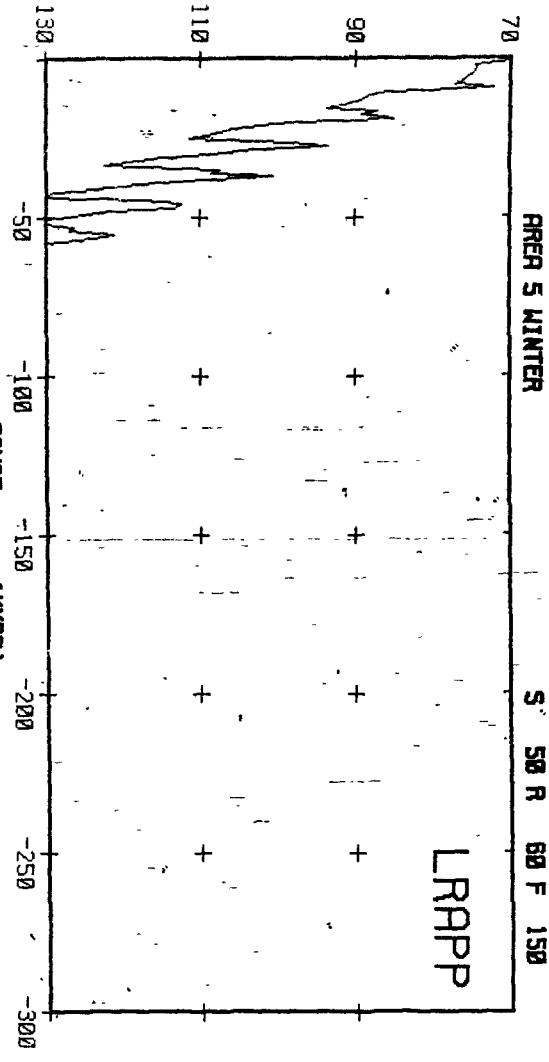




ARRIVAL ANGLE



DB LOSS



70

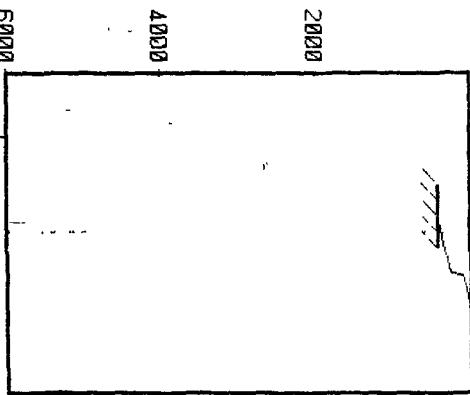
AREA 5 WINTER

S 50 R 60 F 150

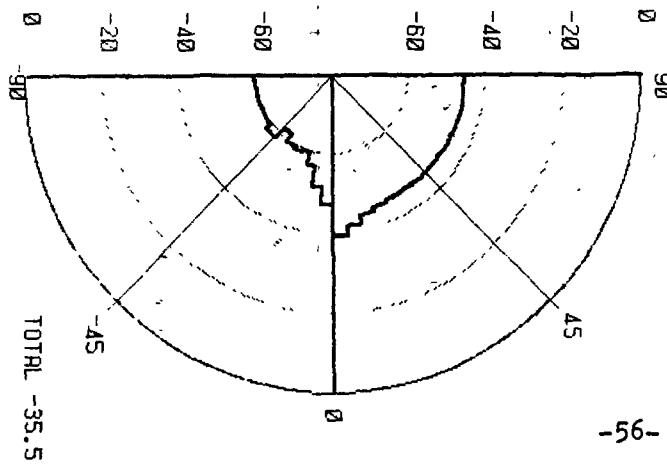
1450 M/S 1500 1550

LRAAPP

DEPTH IN METERS



NOISE (DB)



TOTAL -35.5 DB

-56-

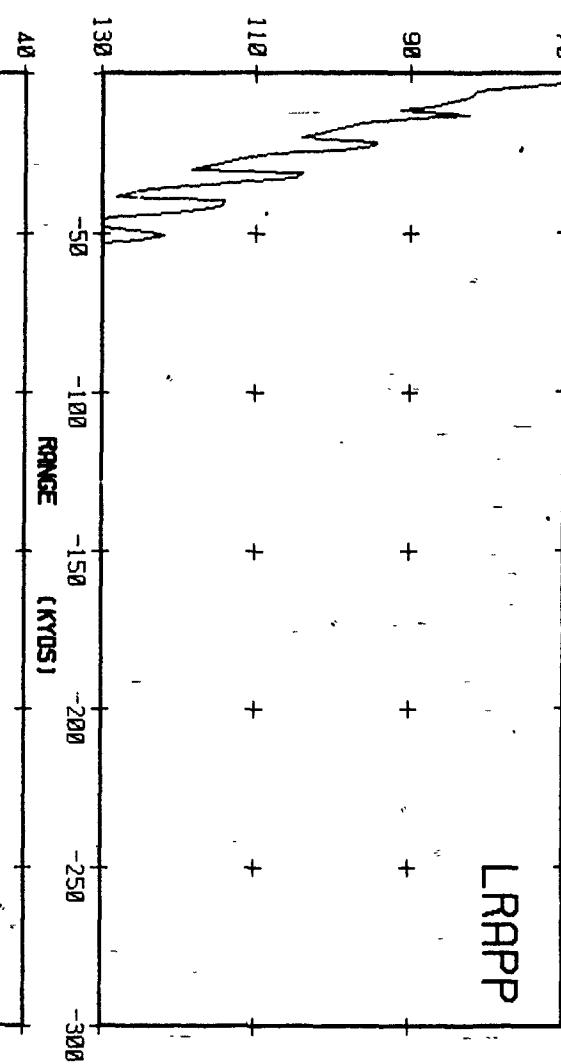
AREA 5 WINTER

S 1620 R 69 F 159

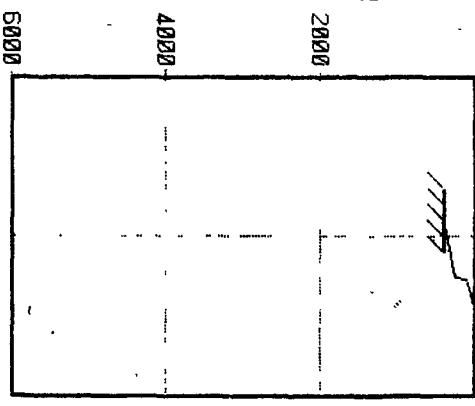
1450 H/S 1500 1550

L RAPP

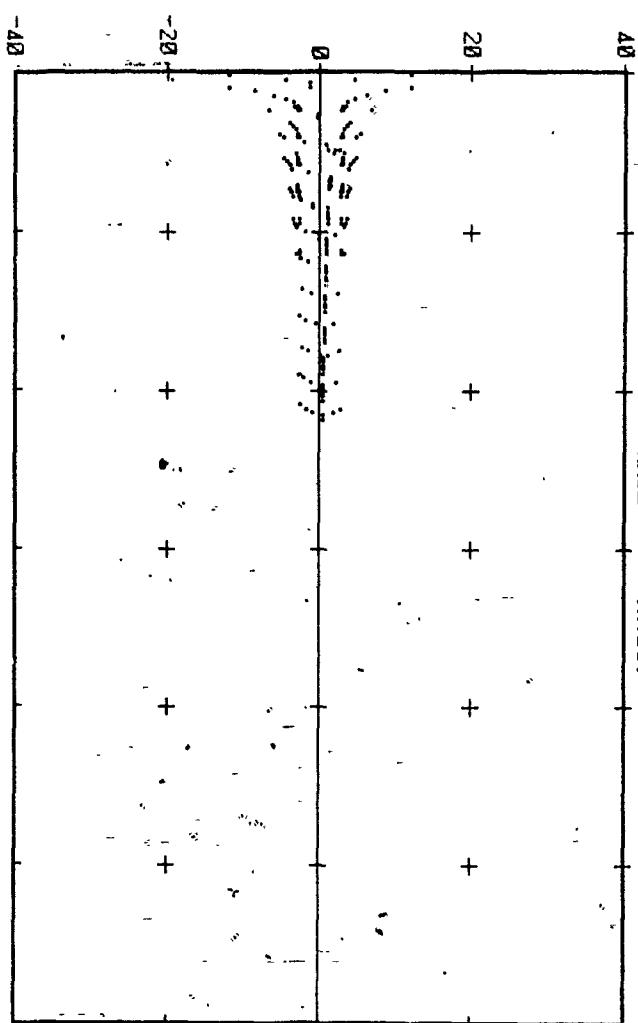
DB LOSS



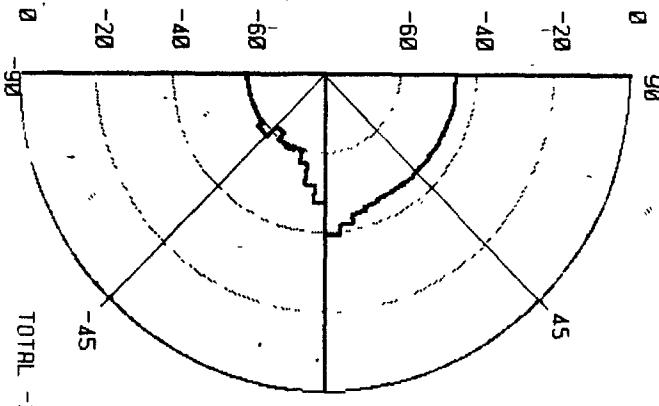
DEPTH IN METERS



ARRIVAL ANGLE

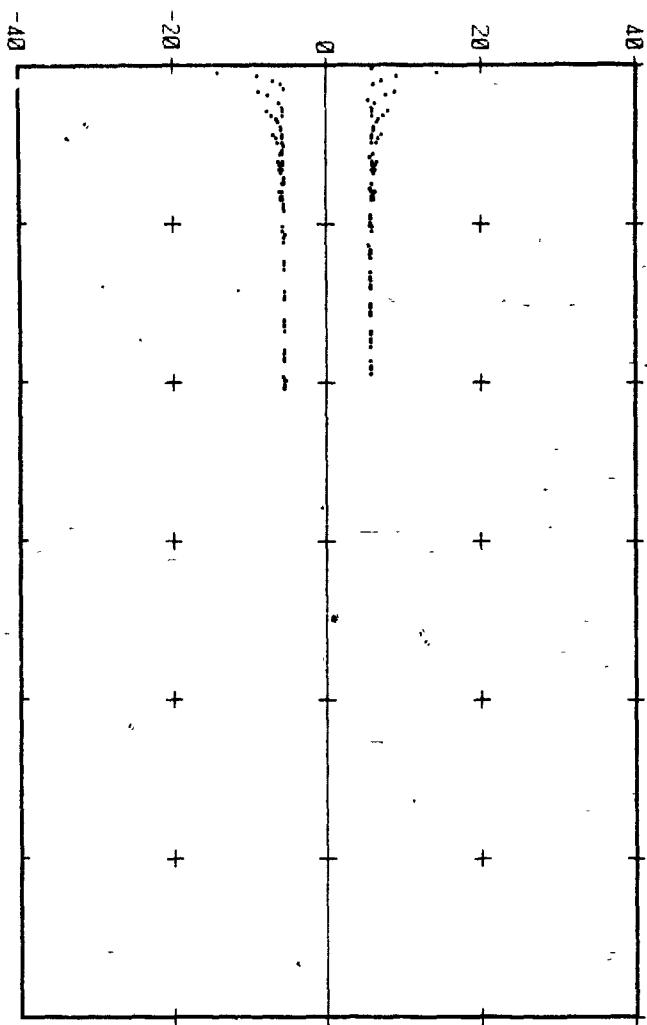


NOISE (DB)

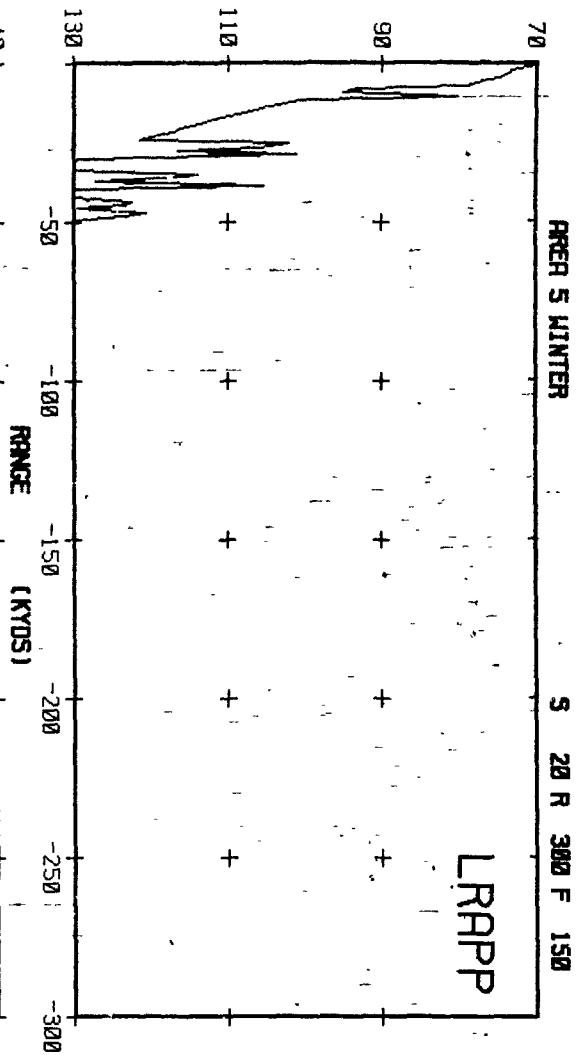


TOTAL -35.5 DB

ARRIVAL ANGLE



DB LOSS



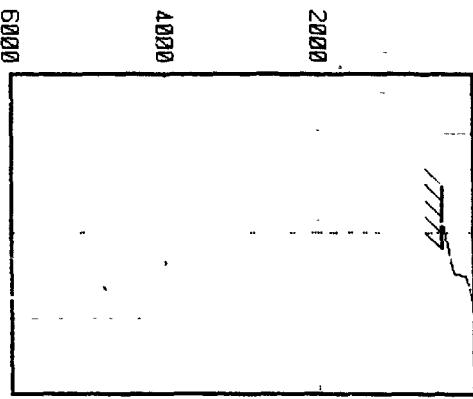
L RAPP

PER 5 WINTER

S 20 R 300 F 150

1450 M/S 1500 1550

DEPTH IN METERS



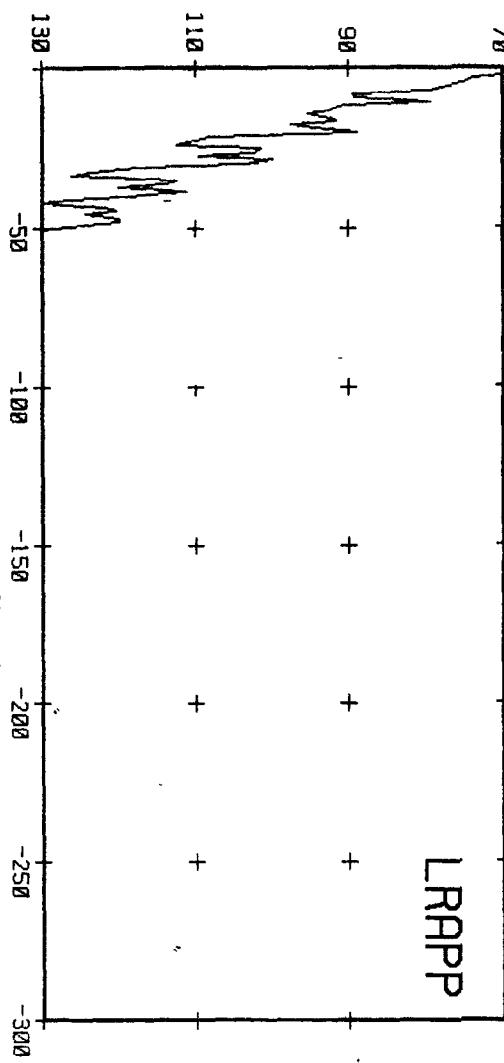
ARR 5 WINTER

S 50 R 300 F 150

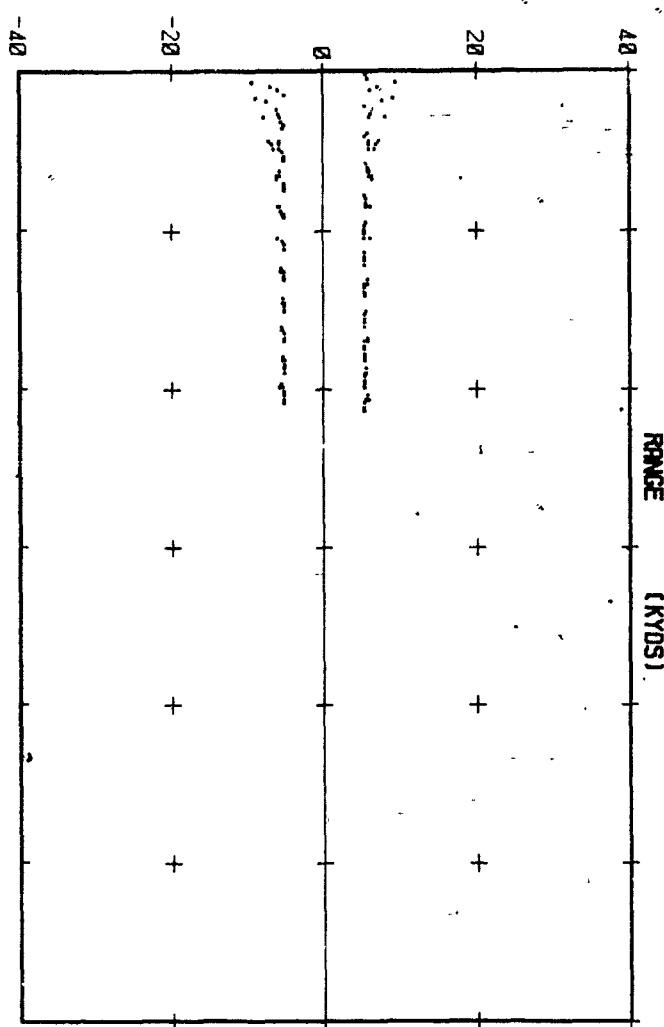
1450 M/S 1500 1550

LRAPP

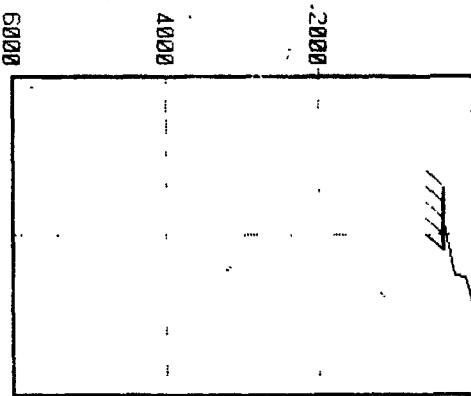
DB LOSS



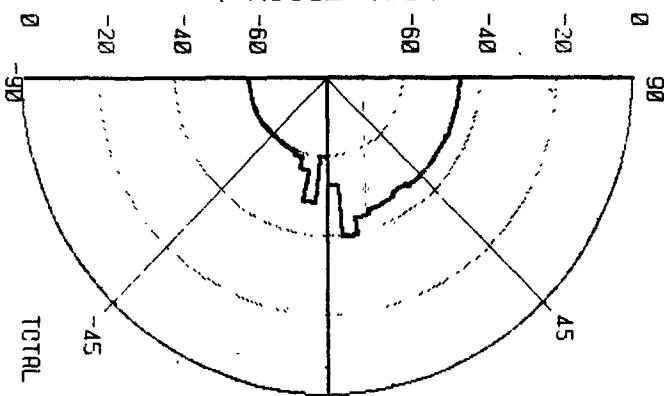
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -36.2 DB

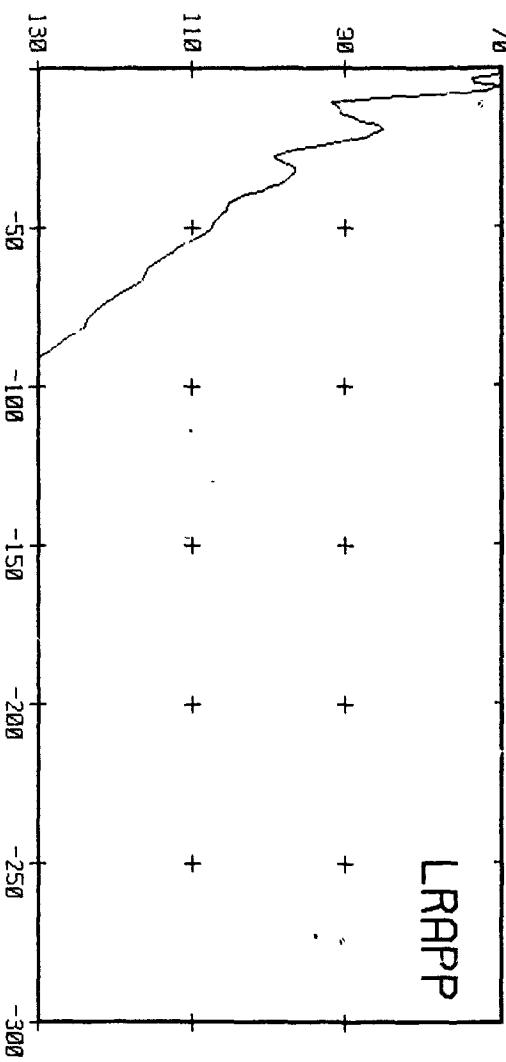
AREA 5 WINTER

S 1020 R 300 F 150

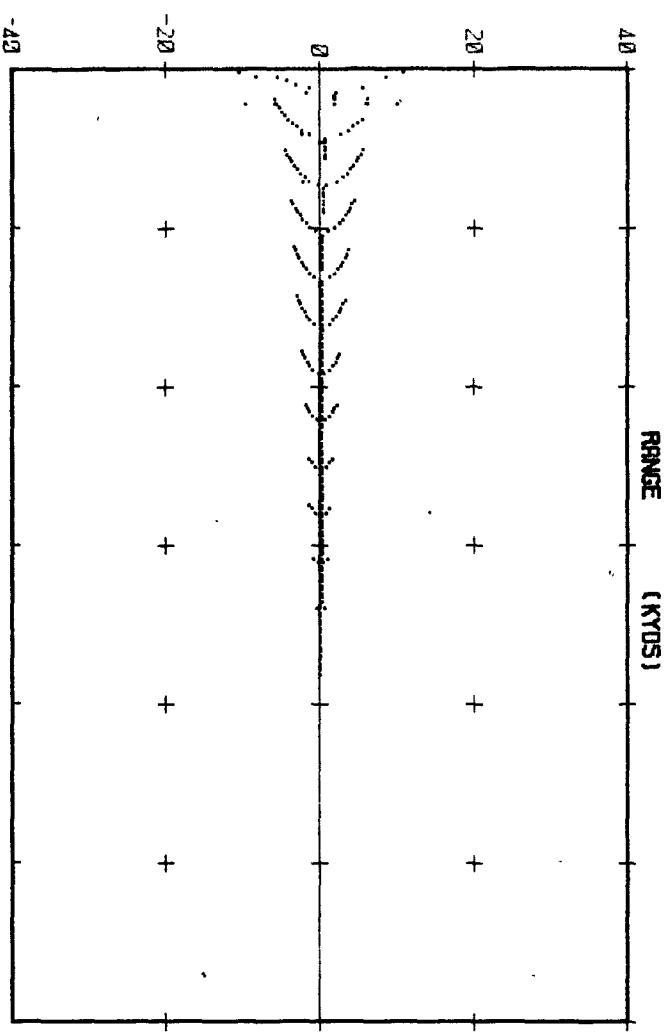
1450 M/S 1500 1550

LRAFP

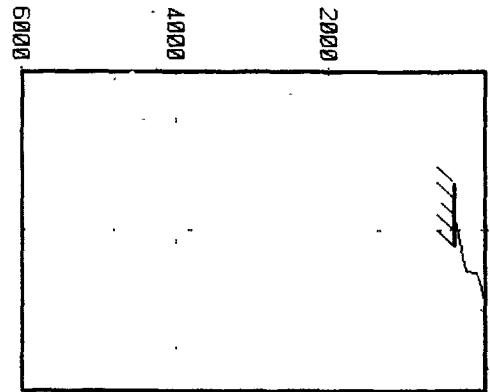
DB LOSS



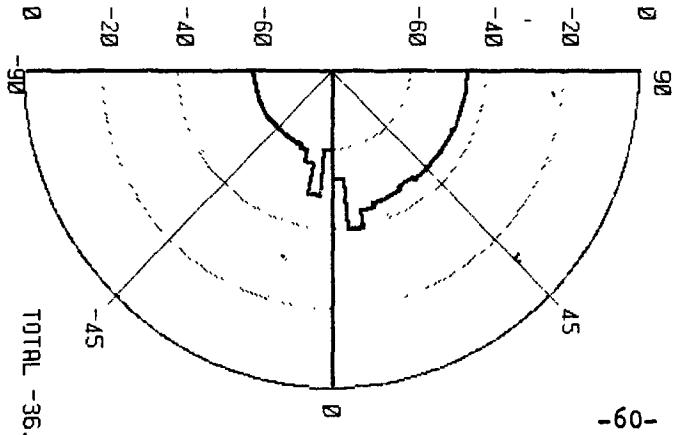
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



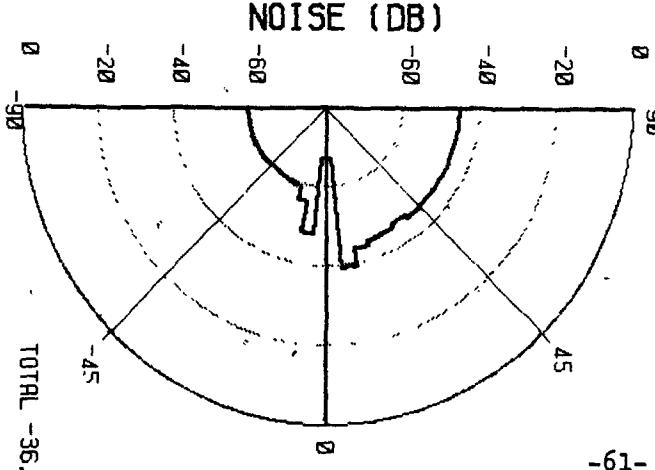
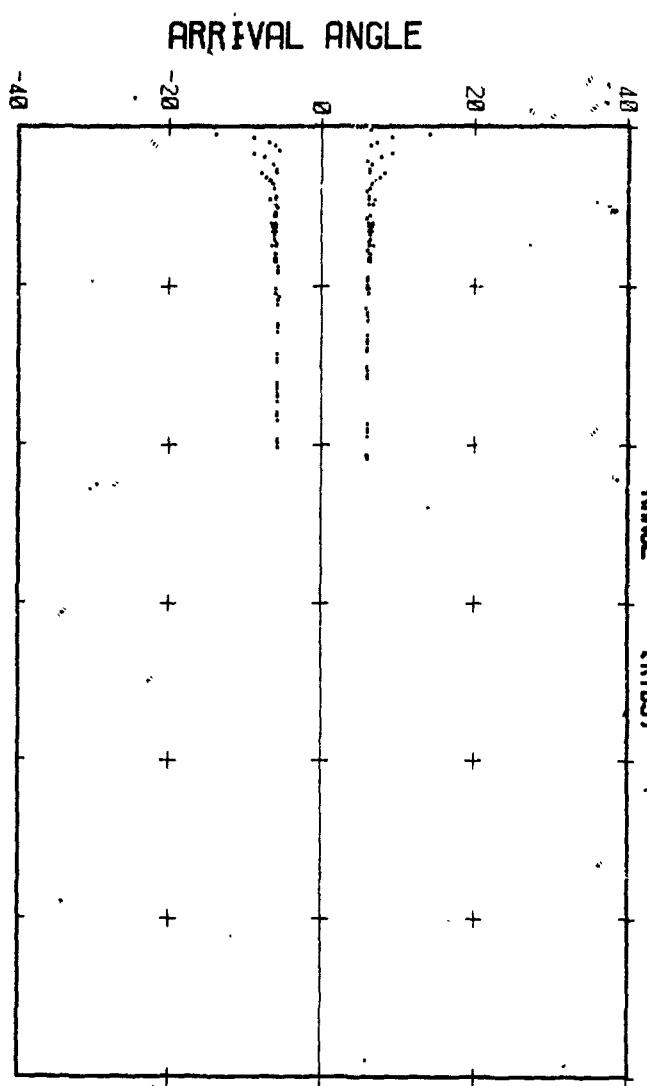
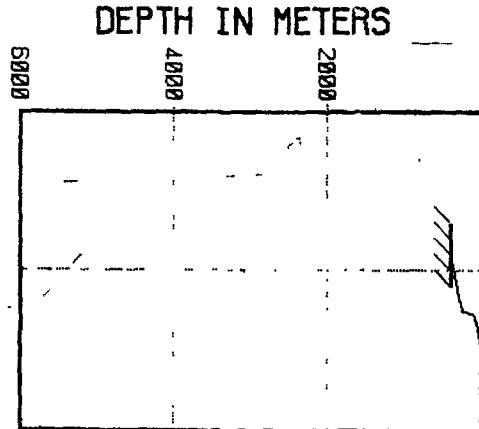
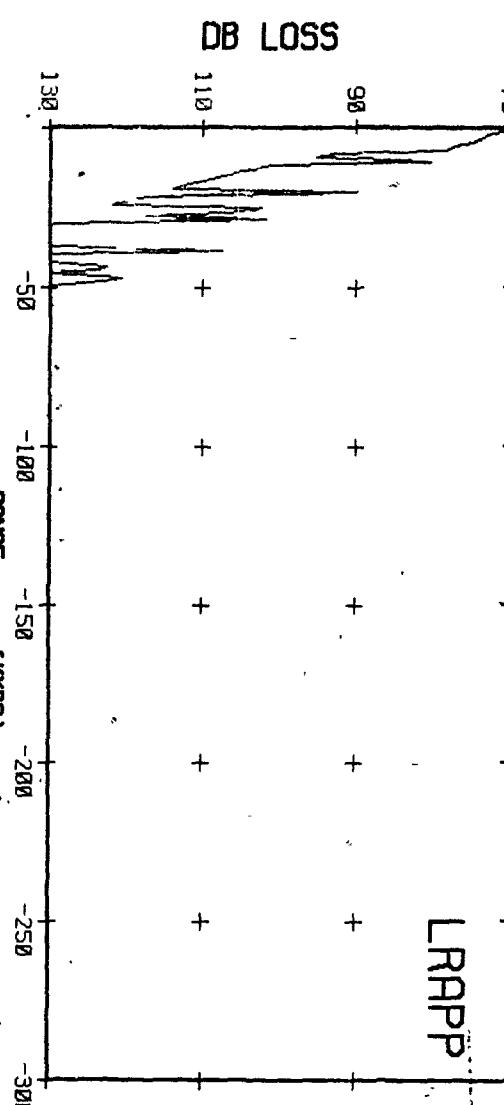
-60-

78 HREN S WINNER 3 22 R 328 F 150

AUGUST 5 WINTER

S 20 R 328 F 150

1450 M/S 1500 1550



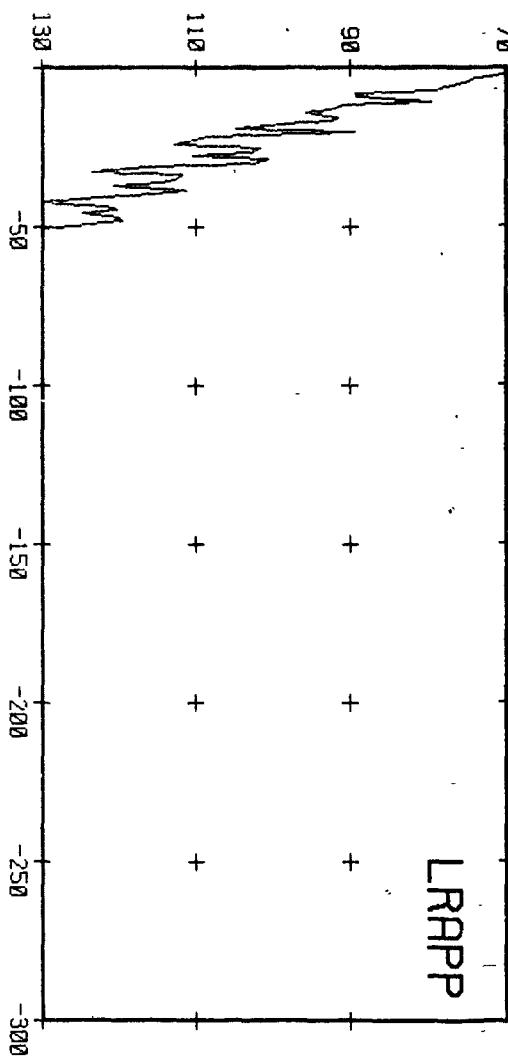
ARR 5 WINTER

S 50 R 328 F 150

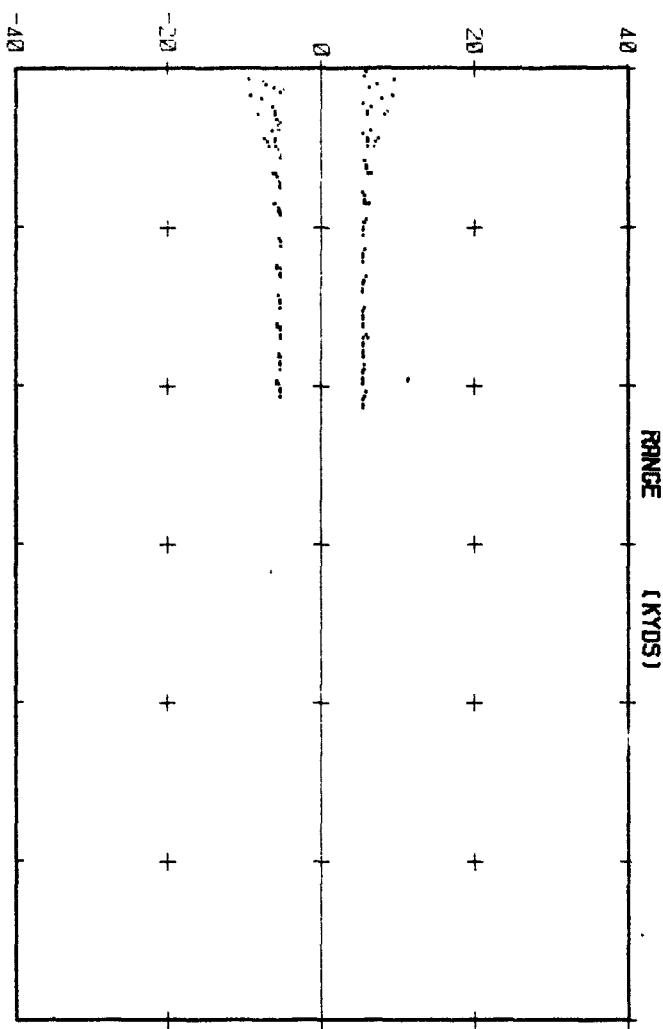
1450 M/S 1500 1550

L RAPP

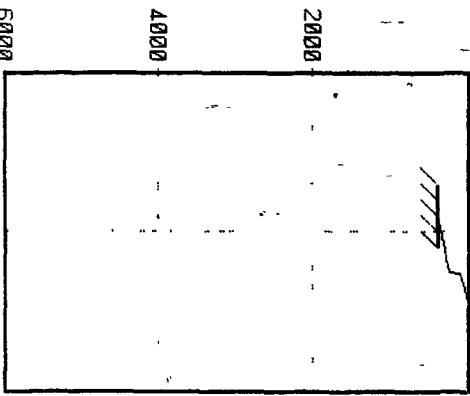
DB LOSS



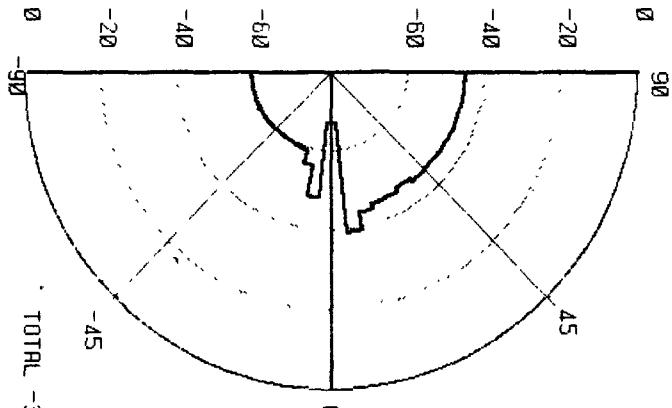
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -36.3 DB

S 1826 R 328 F 158

1450 M/S 1500 1550

70

130

110

90

70

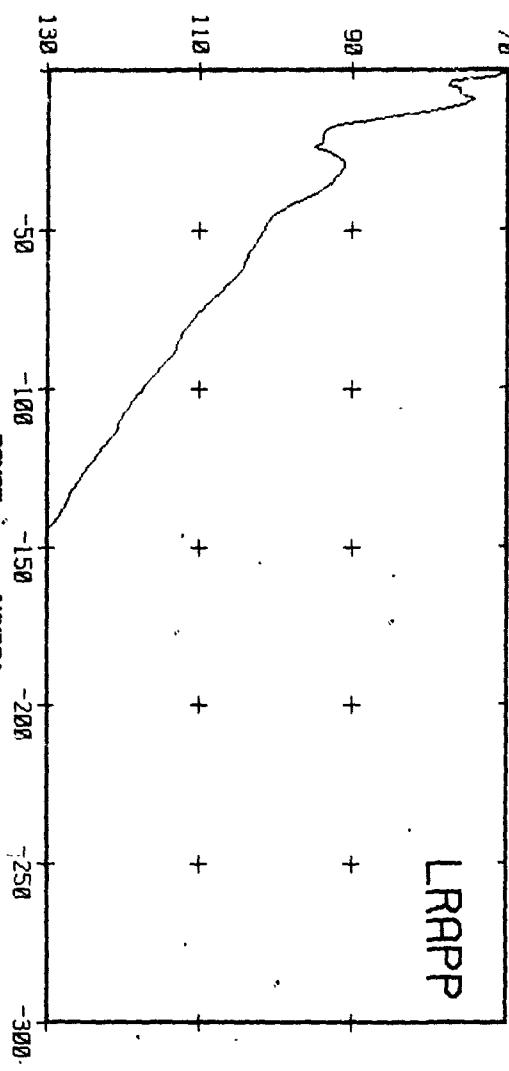
50

30

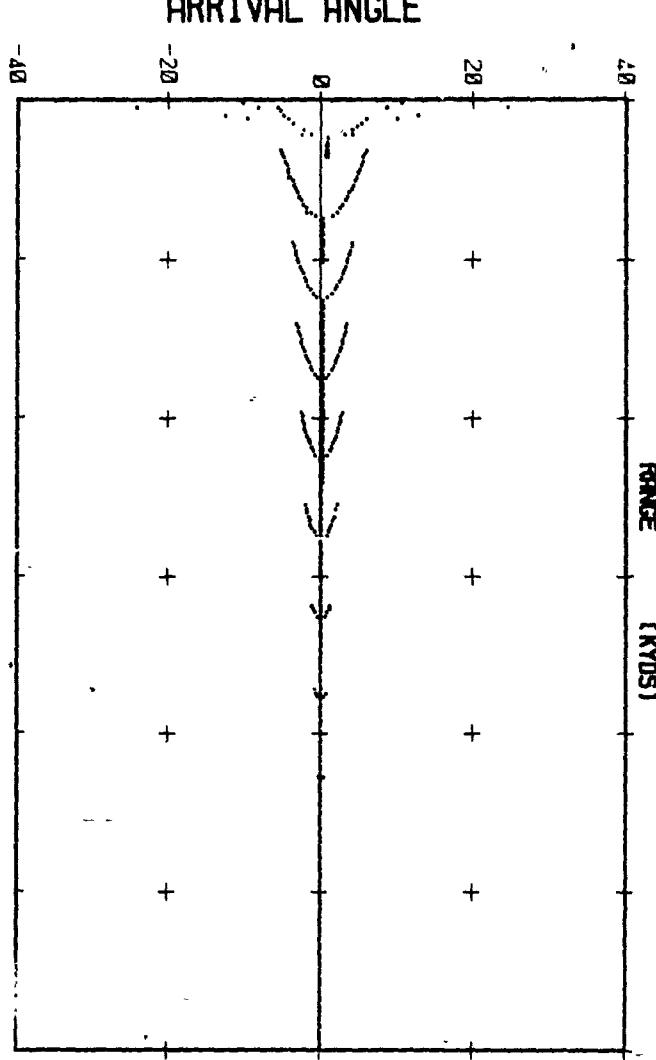
10

0

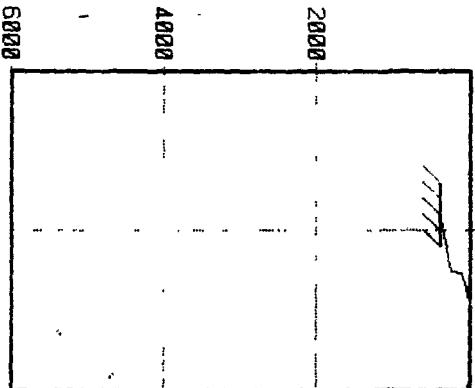
DB LOSS



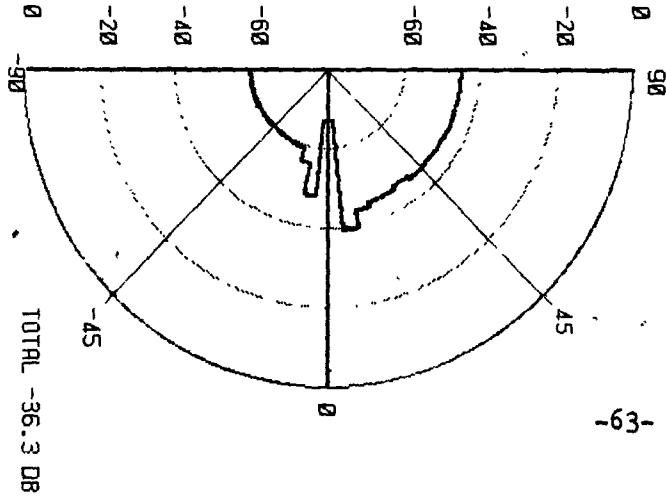
ARRIVAL ANGLE



DEPTH IN METERS



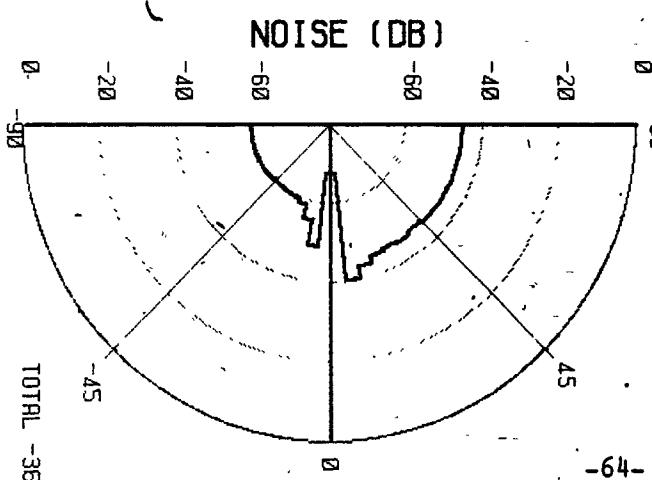
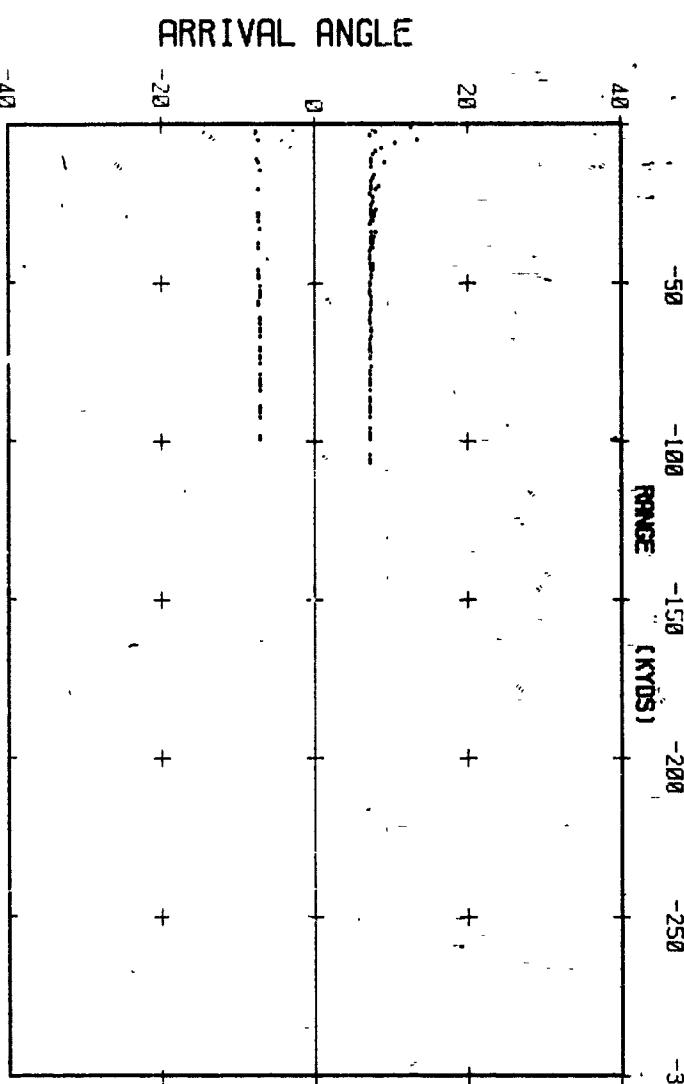
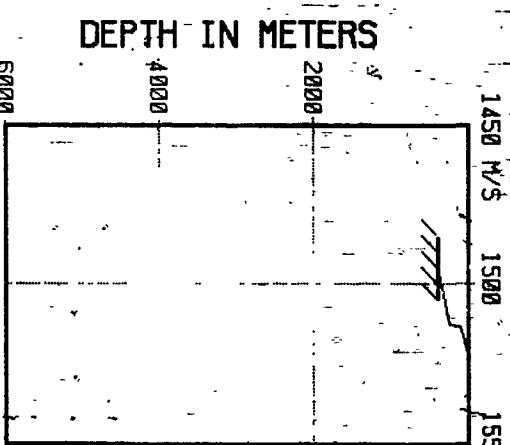
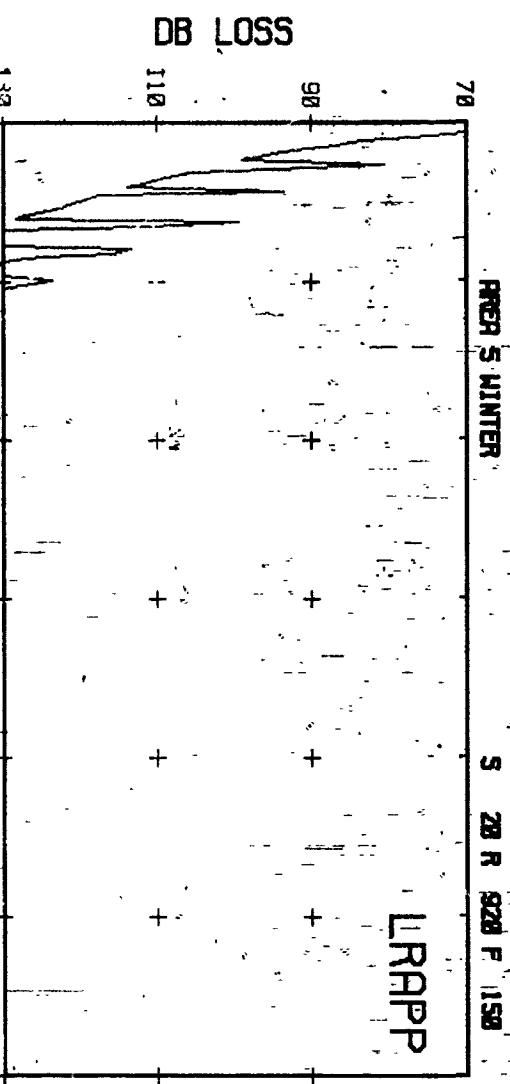
NOISE (DB)



BEE BEE
5 WINTER

2028 P. 15

1450 W \$ 1500 "



70

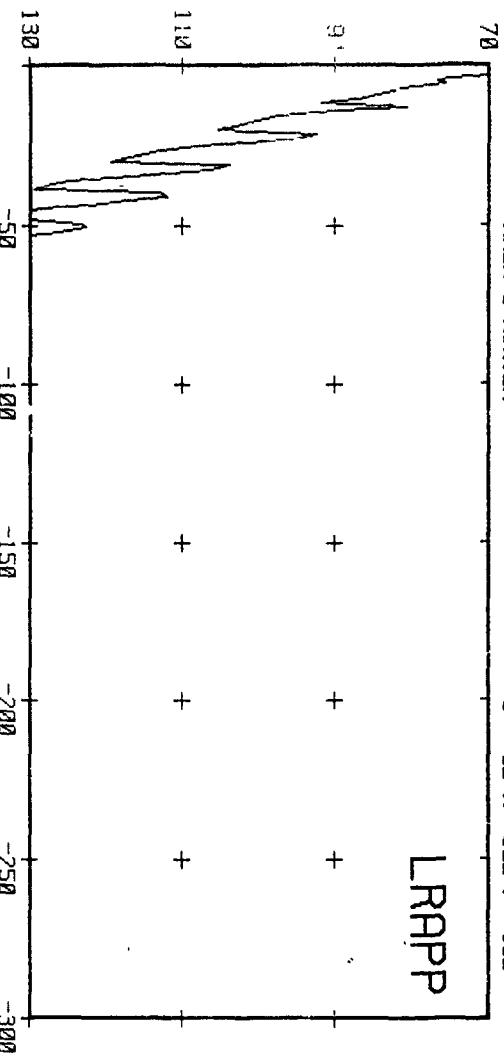
AREA 5 WINTER

S 52 R 920 F 150

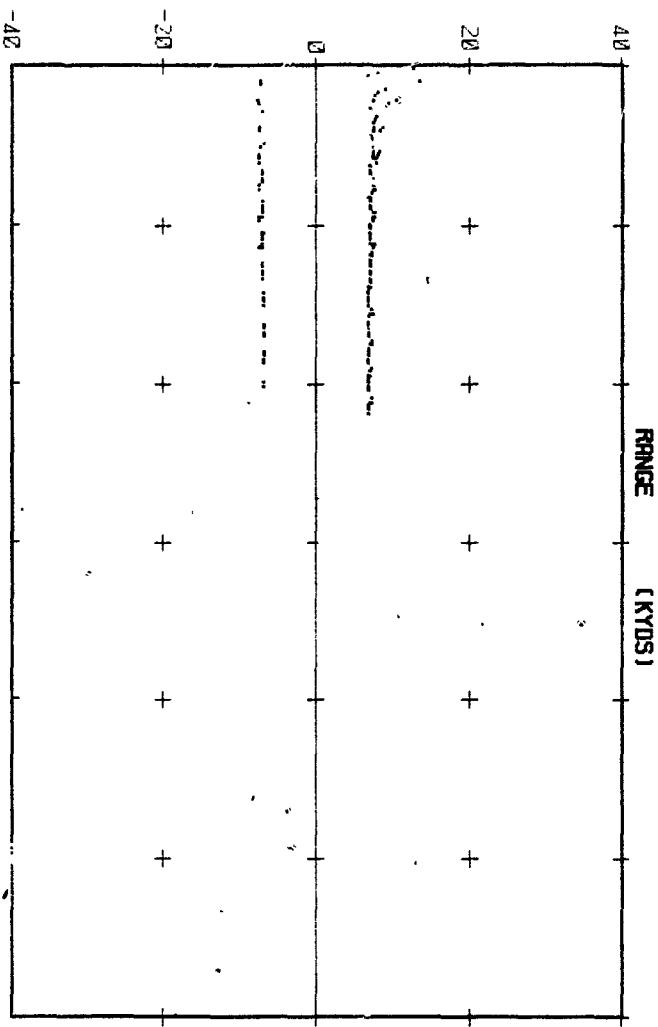
1450 1/V/S 1520 1550

LRAPP

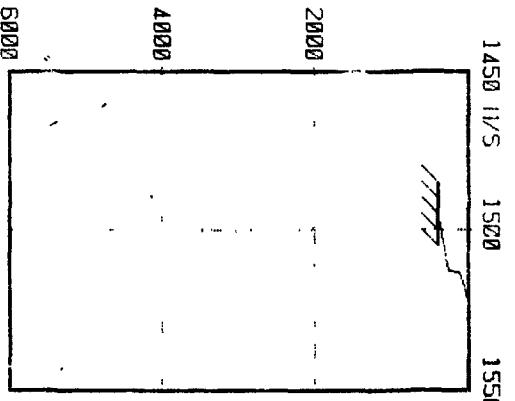
DB LOSS



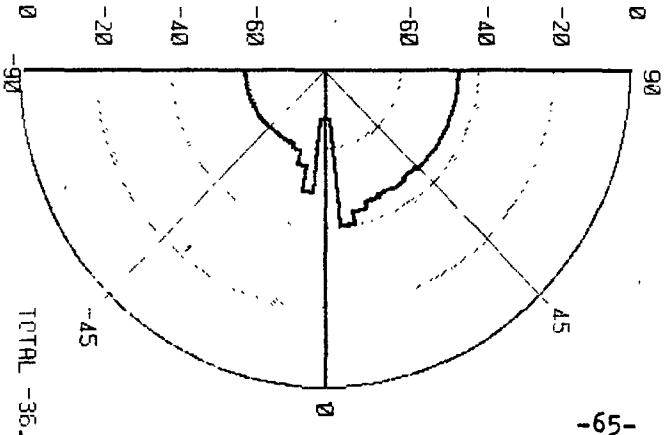
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



70

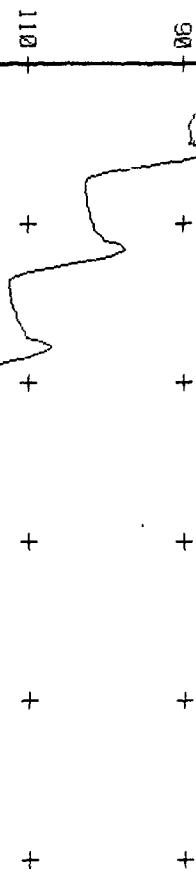
AREA 5 WINTER

S 1020 R 920 F 150

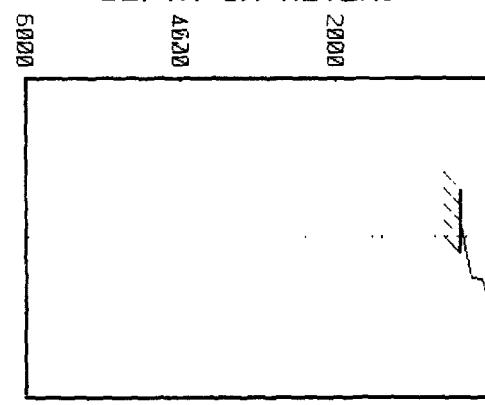
1450 M/S 1500 1550

LRAPP

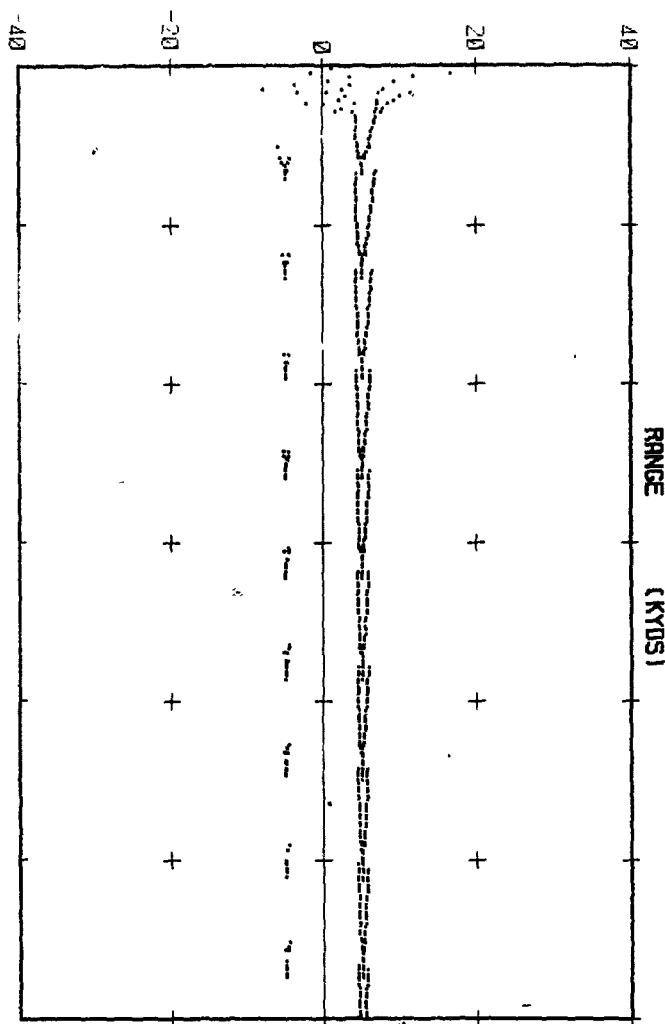
DB LOSS



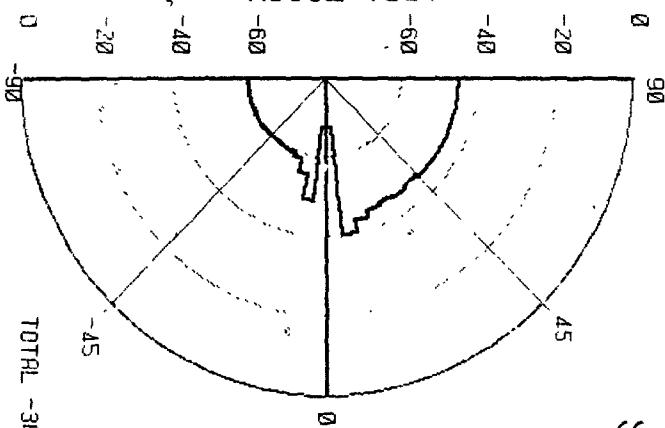
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



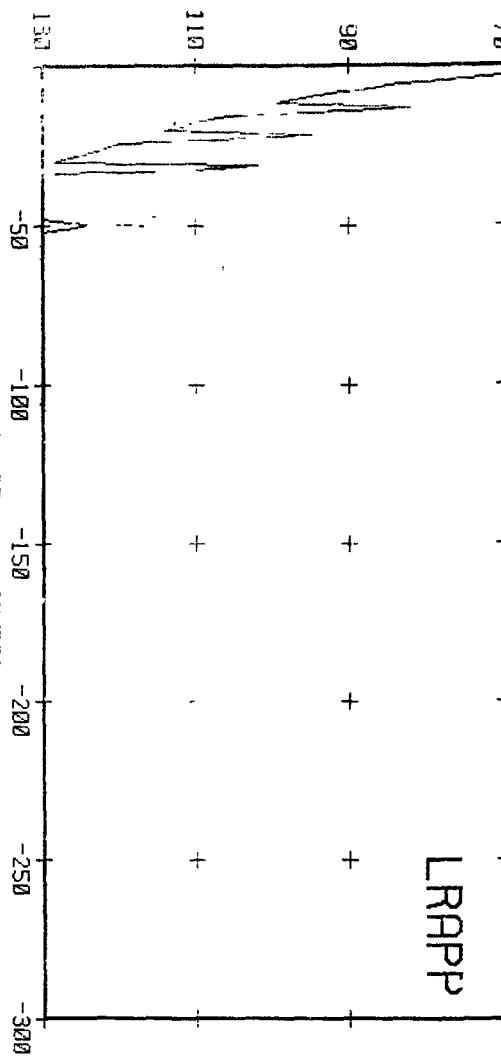
AREA 5 WINTER

S 29 R 1000 F 150

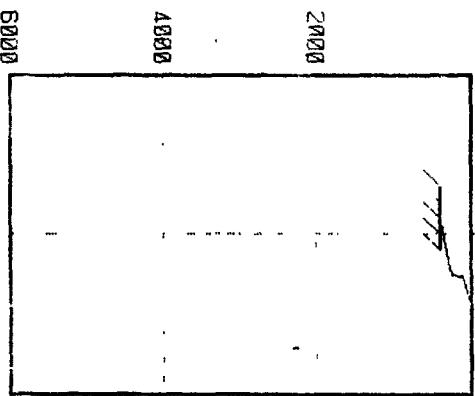
1450 M/S 1500 1550

LRAPP

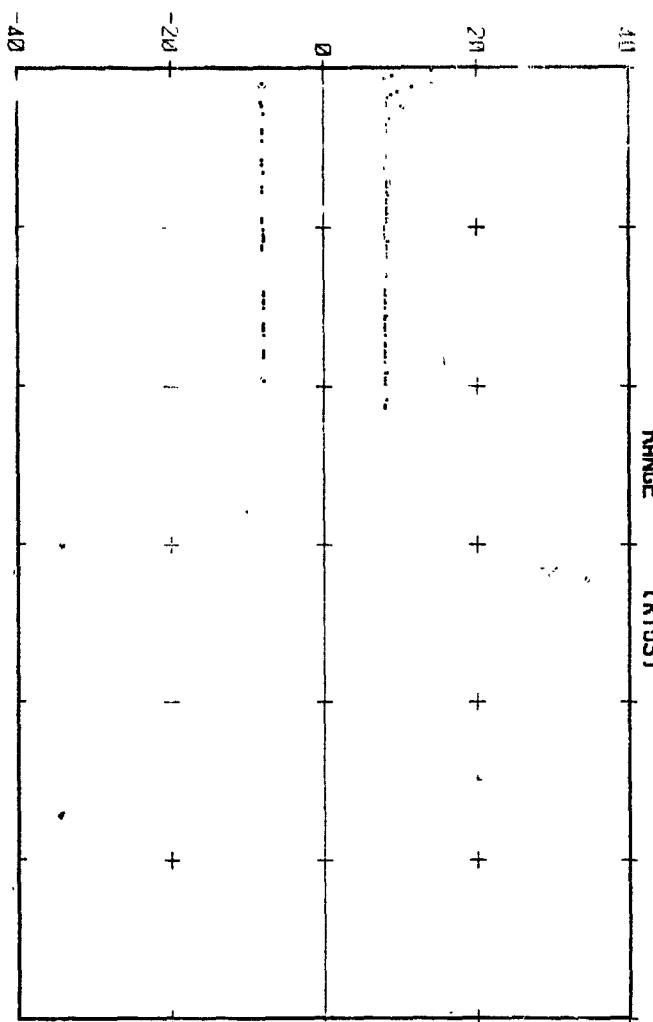
DB LOSS



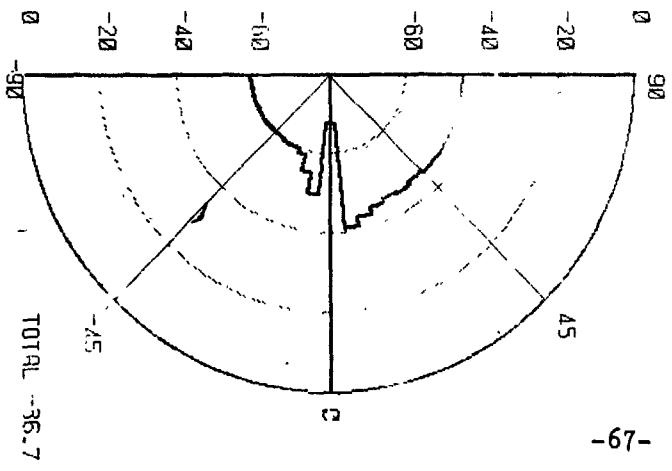
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



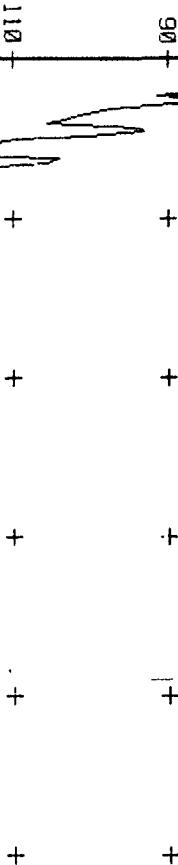
AKER 5 WINTER

S 50 R 1000 F 150

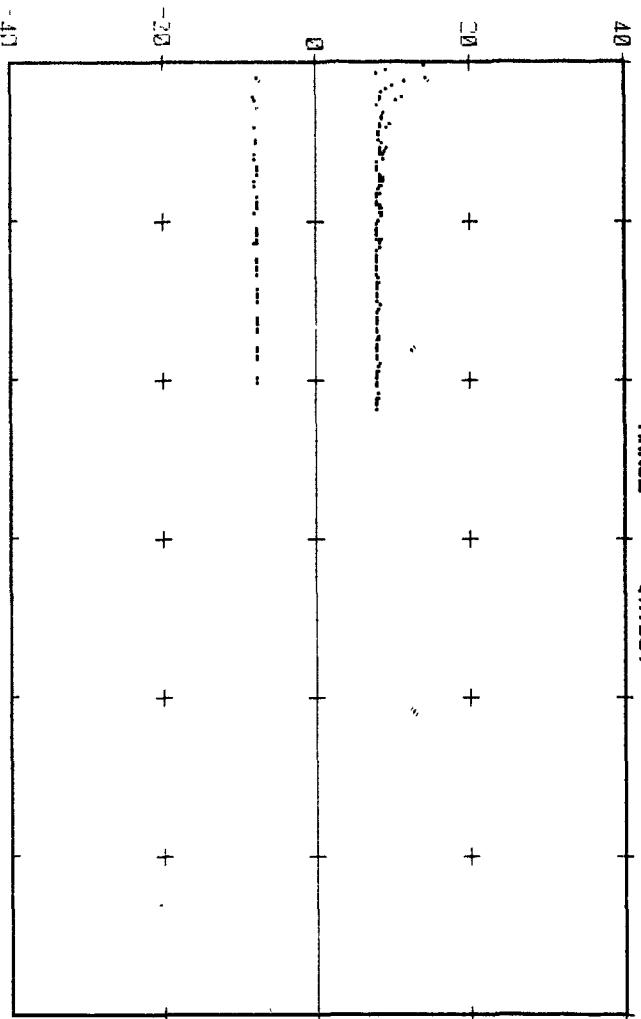
1450 M/S 1500 1550

LRAPP

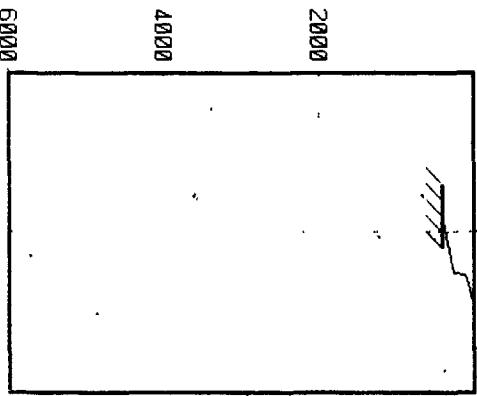
DB LOSS



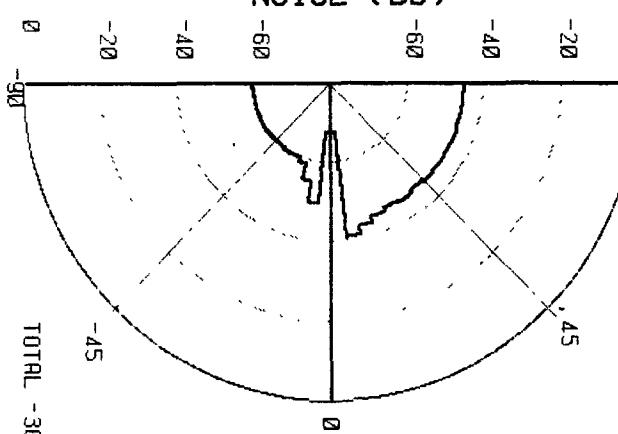
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



70

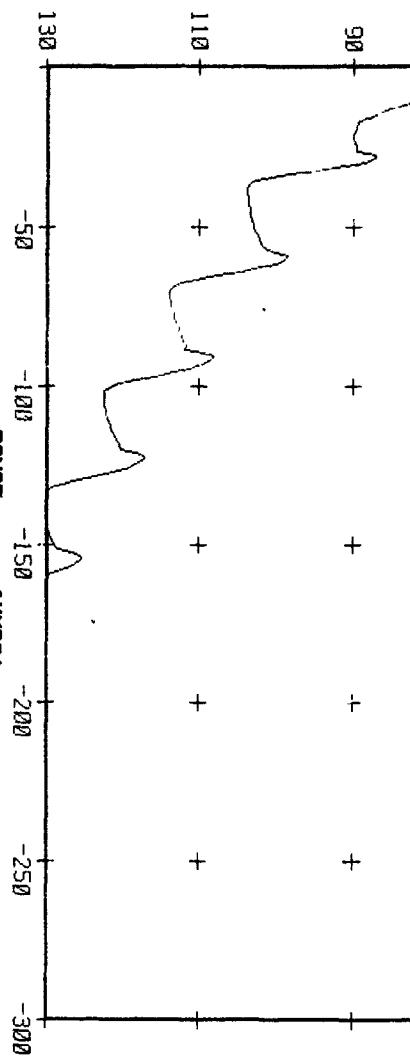
AREA 5 WINTER

S 1020 R 1000 F 150

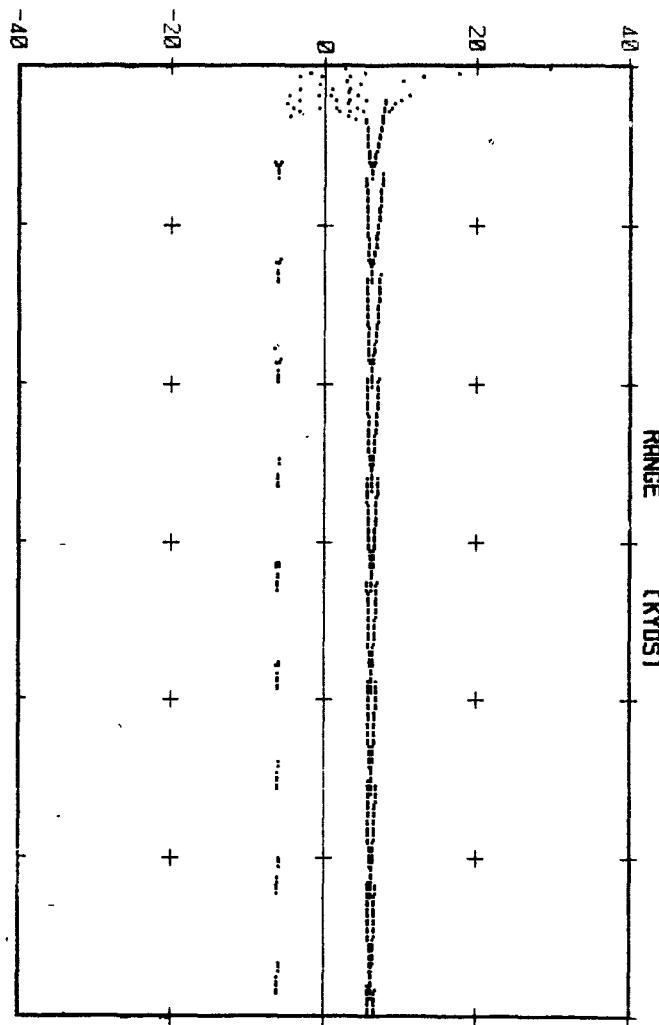
1450 M/S 1500 1550

LRAPP

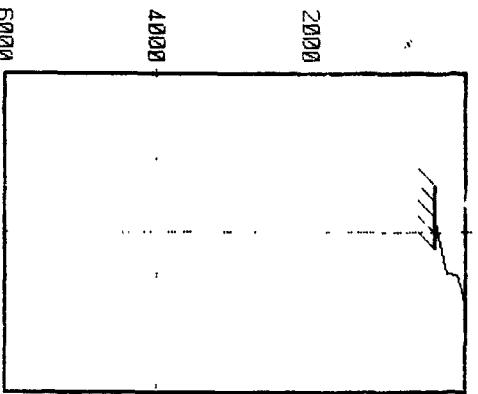
DB LOSS



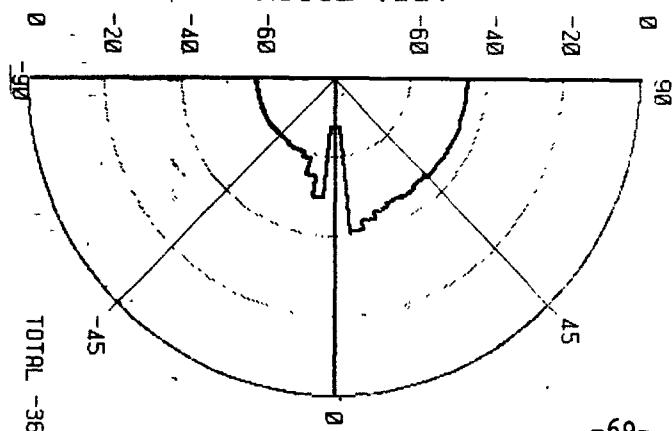
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -36.7 DB

11111111111111111111

11111111111111111111

11111111111111111111

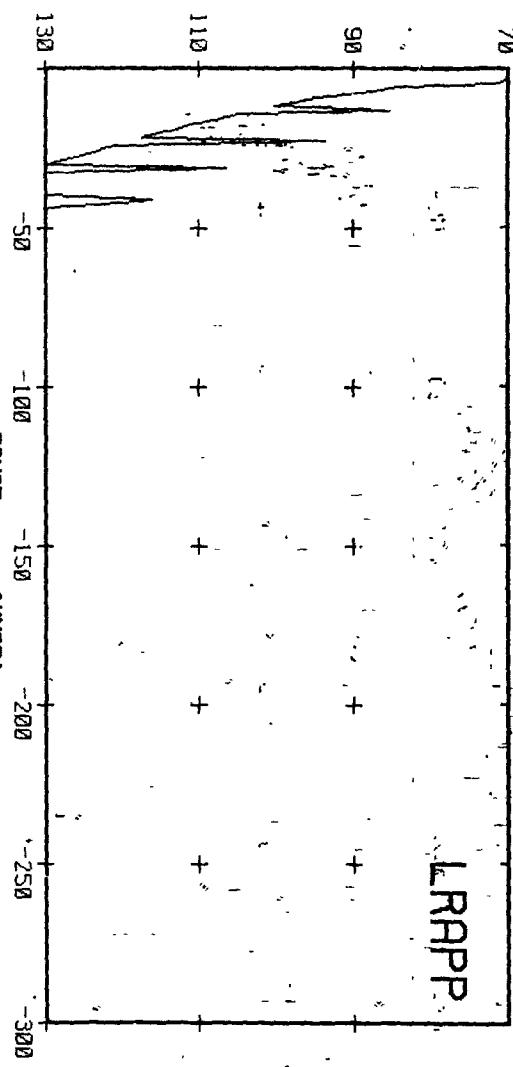
AREA 5 WINTER

S 20 R 1312 F 150

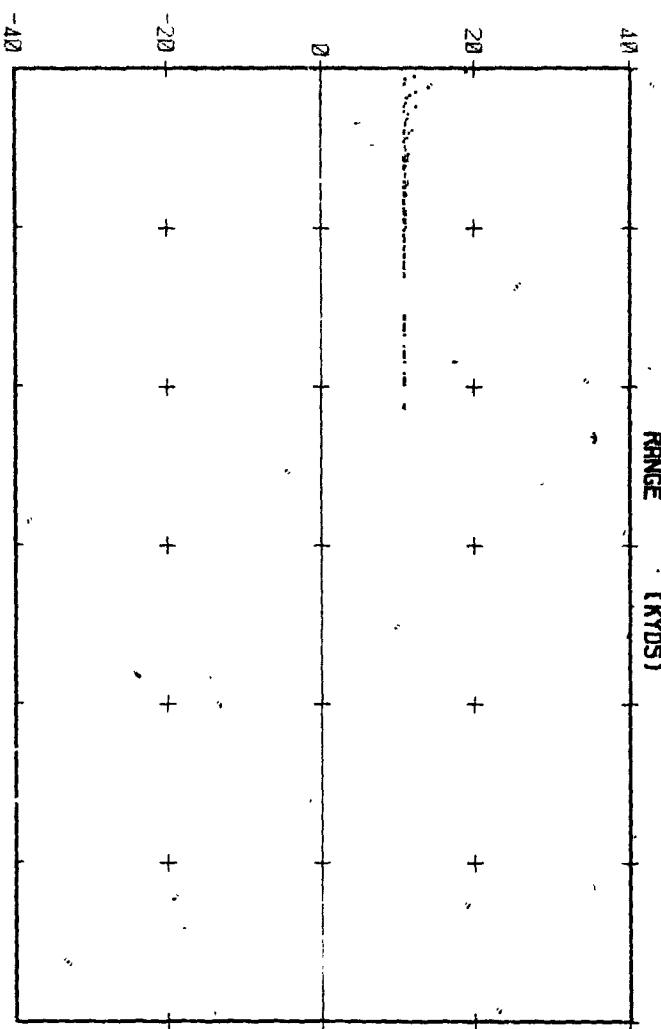
1450 M/S 1500 1550

LRAPP

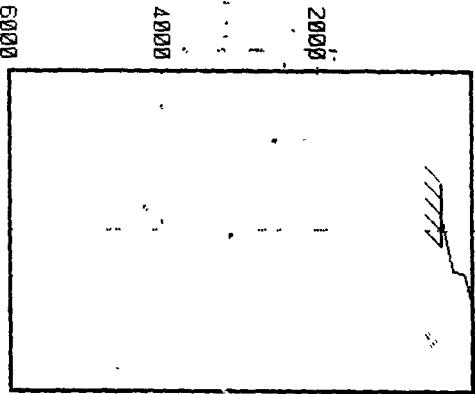
DB LOSS



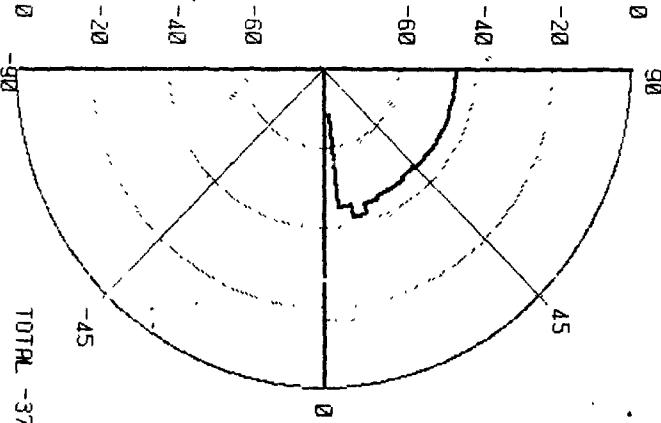
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -37.3 DB

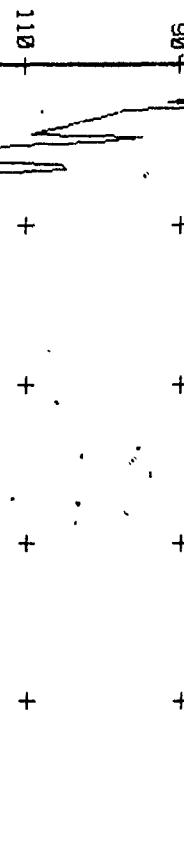
AREA 5 WINTER

S 50 R 1312 F 159

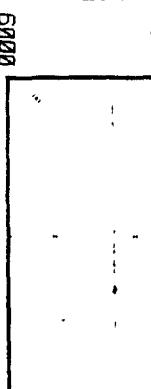
1450 M/S 1500 1550

LRAPP

DB LOSS

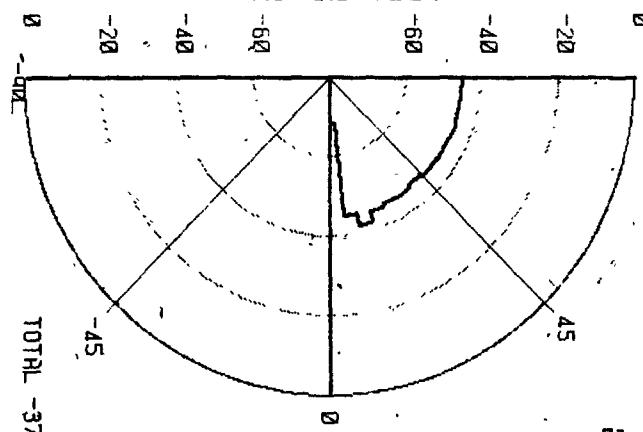
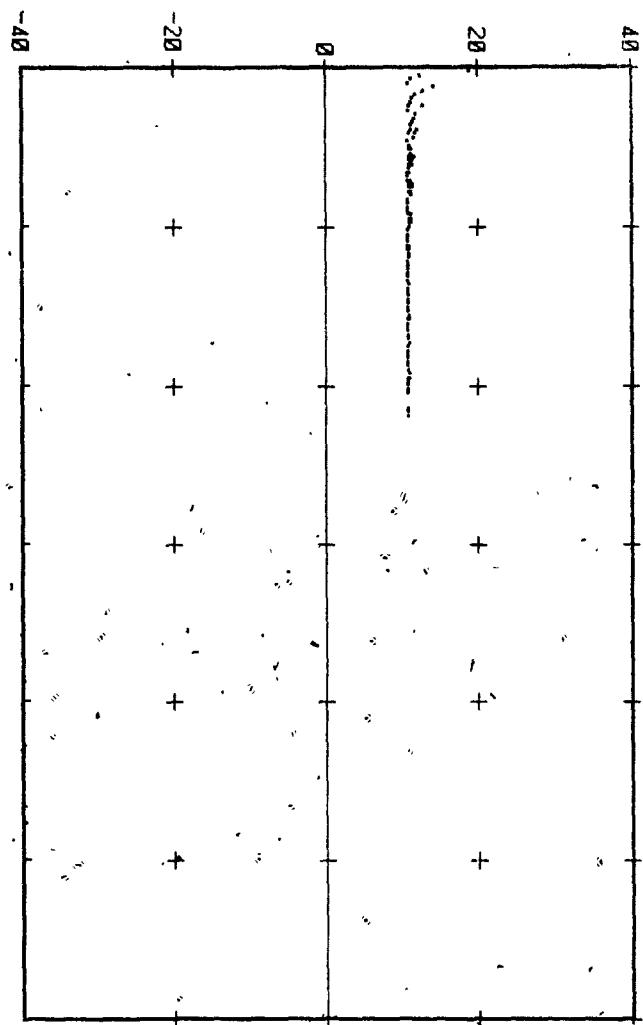


DEPTH IN METERS



NOISE (DB)

ARRIVAL ANGLE



TOTAL -37.3 DB

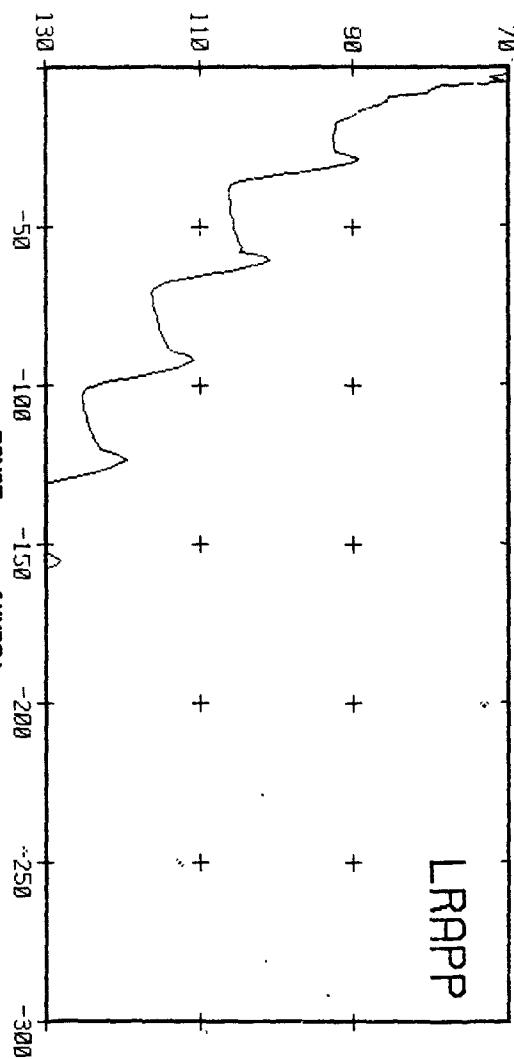
AREA 5 WINTER

S 1020 R 1312 F 150

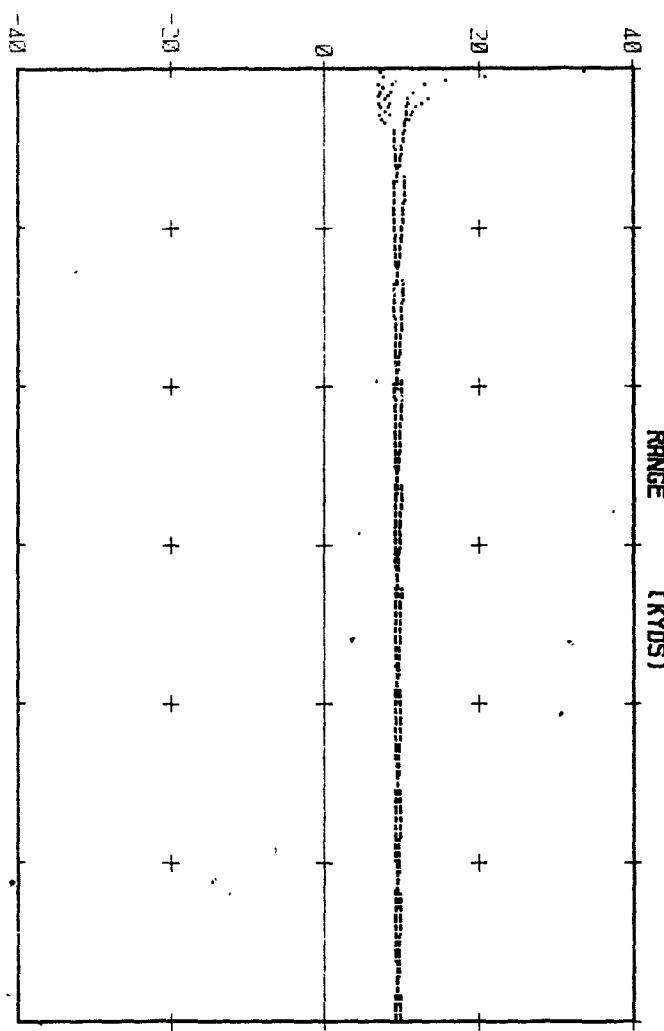
1450 M/S 1500 1550

LRAPP

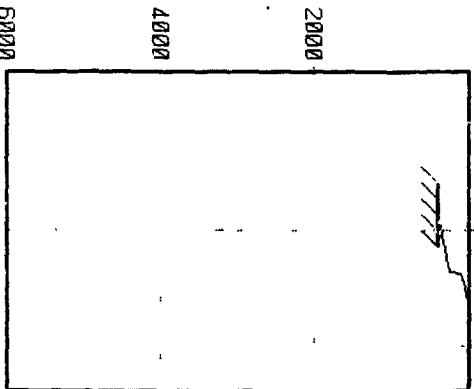
DB LOSS



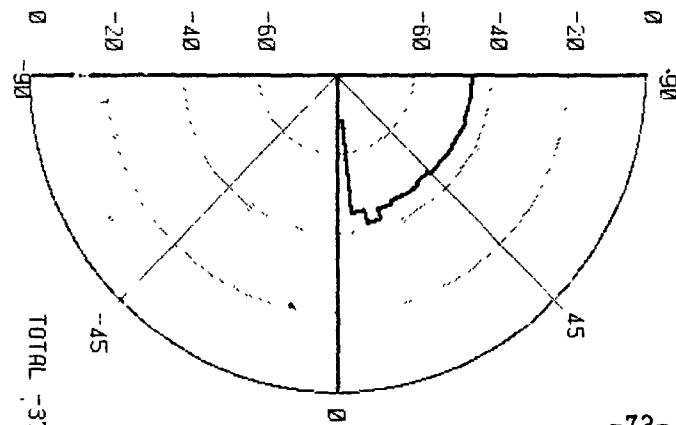
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -37.3 DB

70

AREA 5 WINTER

S 20 R 60 F 300

1450 M/S 1500 1550

LRAPP

DB LOSS

90

+

+

+

+

+

+

130

50

100

150

200

250

300

RANGE (KYDS)

ARRIVAL ANGLE

-20

+

+

+

+

+

+

-

-

-

-

-73-

DEPTH IN METERS

0

2000

4000

6000

0

90

180

270

360

450

540

630

720

810

900

990

1080

1170

1260

1350

1440

1530

1620

1710

1800

1890

1980

2070

2160

2250

2340

2430

2520

2610

2700

2790

2880

2970

3060

3150

3240

3330

3420

3510

3600

3690

3780

3870

3960

4050

4140

4230

4320

4410

4500

4590

4680

4770

4860

4950

5040

5130

5220

5310

5400

5490

5580

5670

5760

5850

5940

6030

6120

6210

6300

6390

6480

6570

6660

6750

6840

6930

7020

7110

NOISE (DB)

-60

-40

-20

0

20

40

60

80

100

120

140

160

180

200

220

240

260

280

300

320

340

360

380

400

420

440

460

480

500

520

540

560

580

600

620

640

660

680

700

720

740

760

780

800

820

840

860

880

900

920

940

960

980

1000

1020

1040

1060

1080

1100

1120

1140

1160

1180

1200

1220

1240

1260

1280

1300

1320

1340

1360

1380

1400

1420

1440

1460

1480

1500

1520

DEPTH IN METERS

0

2000

4000

6000

8000

10000

12000

14000

16000

18000

20000

22000

24000

26000

28000

30000

32000

34000

36000

38000

40000

42000

44000

46000

48000

50000

52000

54000

56000

58000

60000

62000

64000

66000

68000

70000

72000

74000

76000

78000

80000

82000

84000

86000

88000

90000

92000

94000

96000

98000

100000

102000

104000

106000

108000

110000

112000

114000

116000

118000

120000

122000

124000

126000

128000

130000

132000

134000

136000

138000

140000

142000

144000

146000

148000

150000

152000

154000

156000

158000

DEPTH IN METERS

0

2000

4000

6000

8000

10000

12000

14000

16000

18000

20000

22000

24000

26000

28000

30000

32000

34000

36000

38000

40000

42000

44000

46000

48000

50000

52000

54000

56000

58000

60000

62000

64000

66000

68000

70000

72000

74000

76000

78000

80000

82000

84000

86000

AREA 5 WINTER

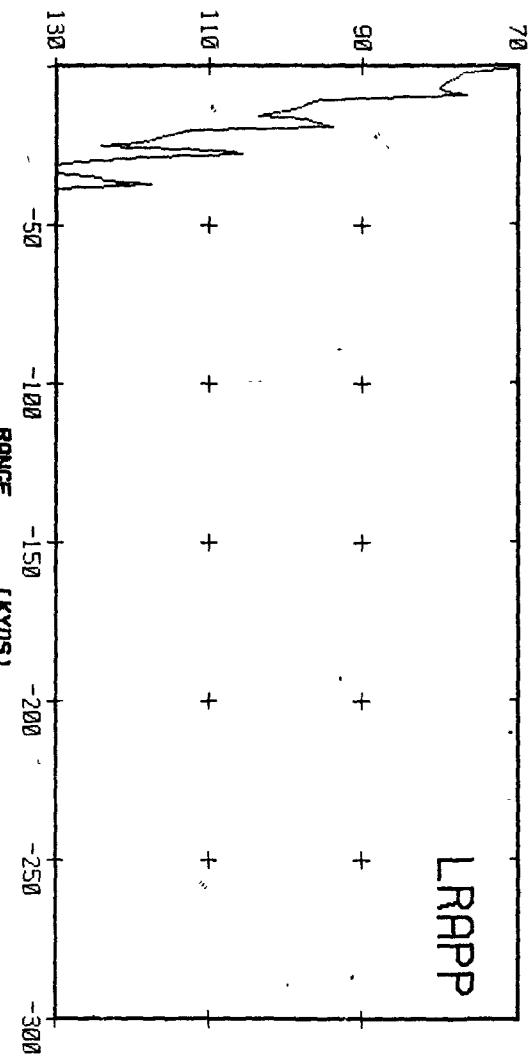
70

S 50 R 63 F 300

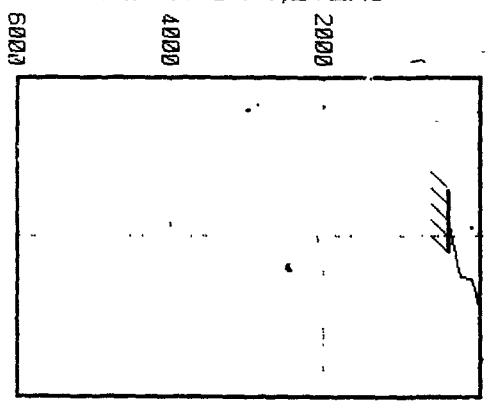
1450 M/S 1500 1550

LRAPP

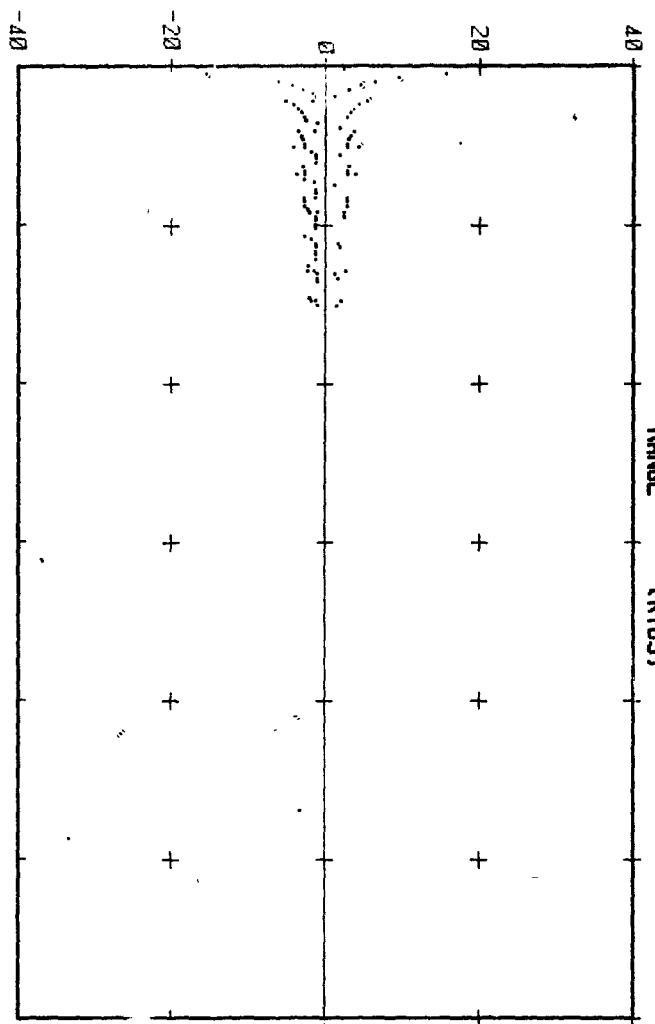
DB LOSS



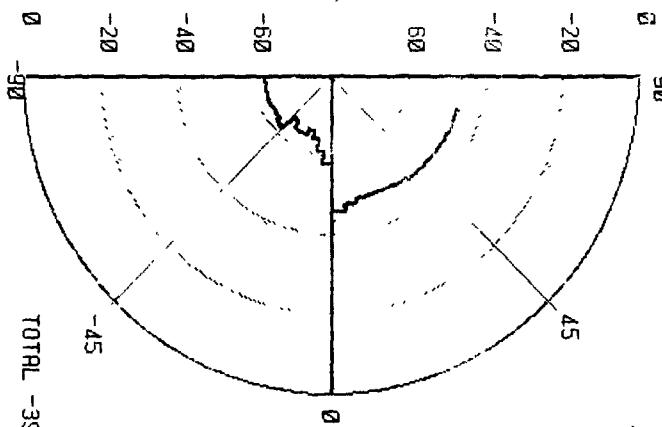
DEPTH IN METERS



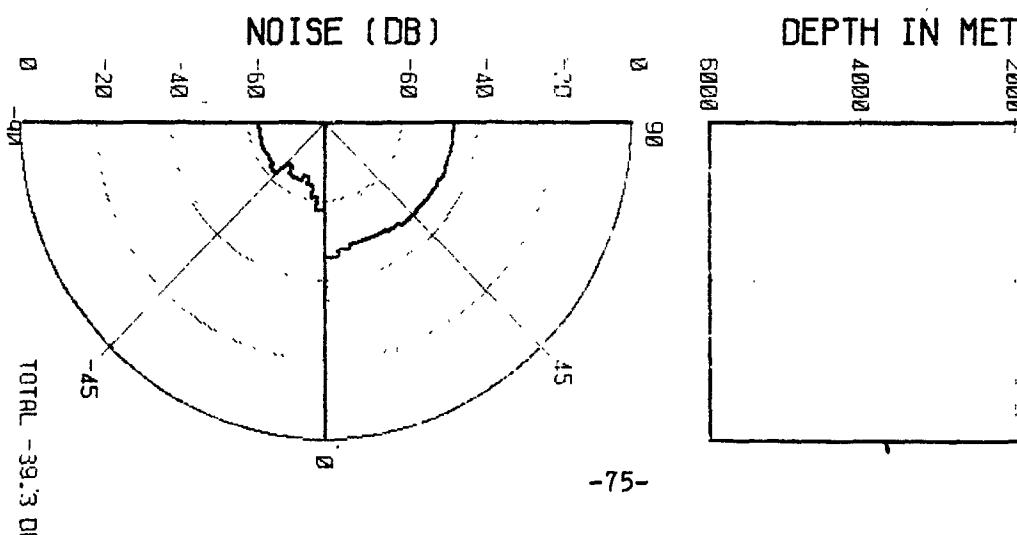
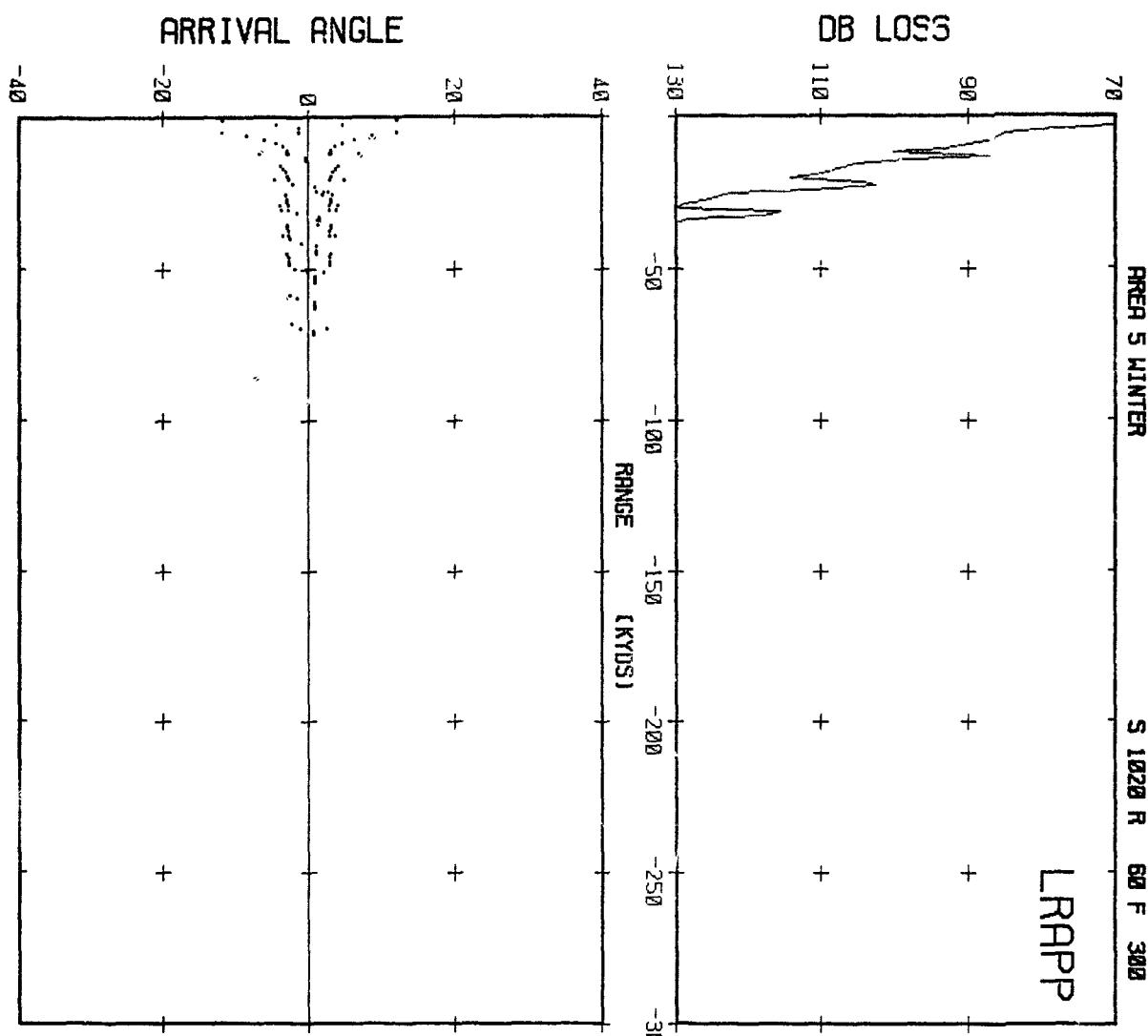
ARRIVAL ANGLE



NOISE (DB)



TOTAL -39.3 DB



-75-

H
I
J

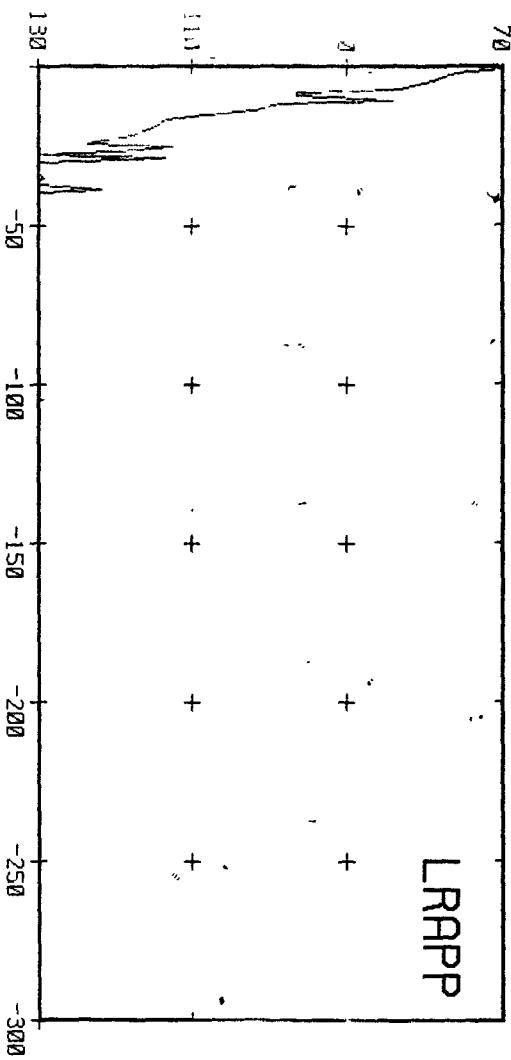
AREA 5 WINTER

S 20 R 300 F 300

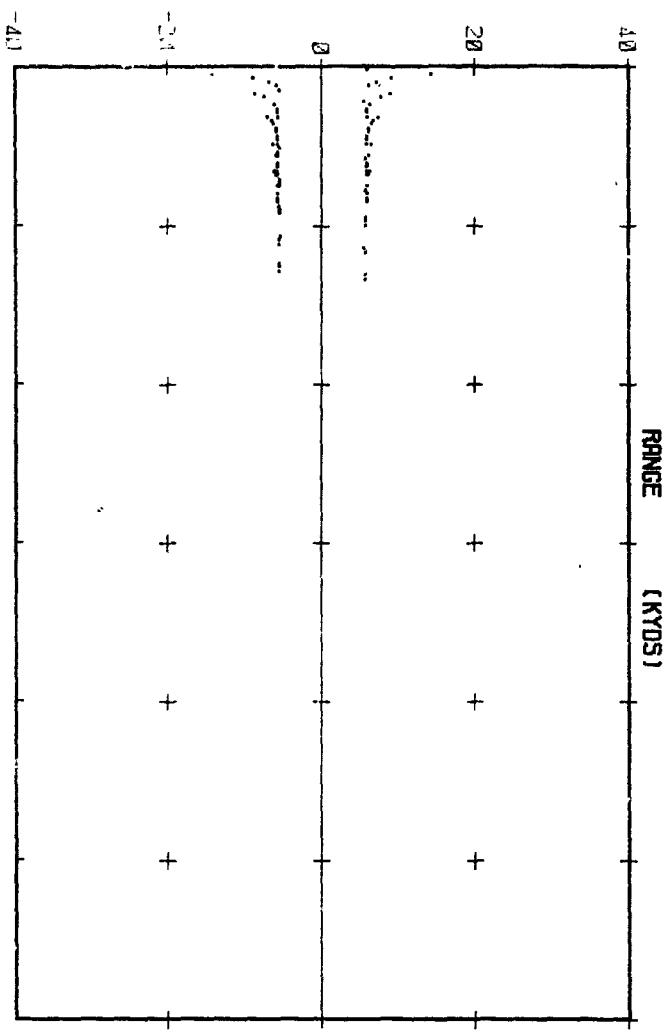
1450 M/S 1500 1550

LRAAPP

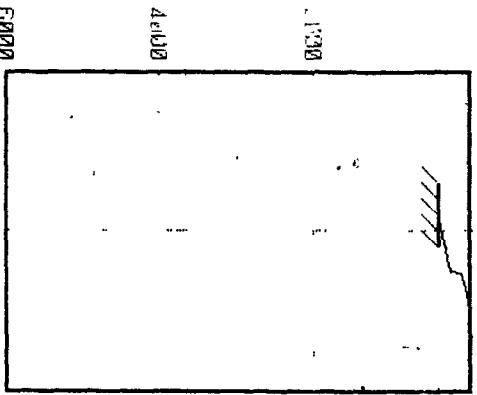
DB LOSS



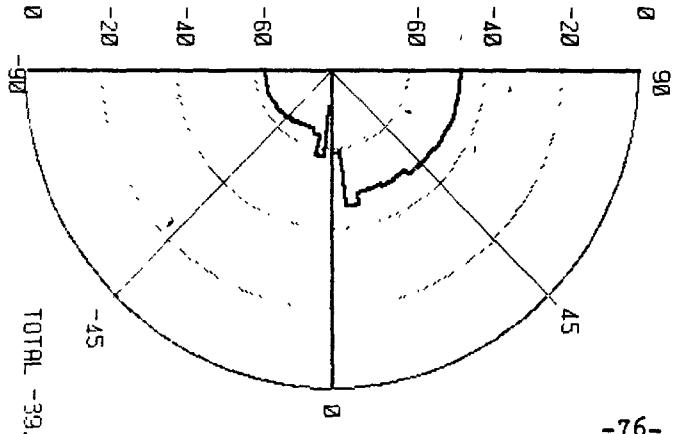
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -39.7 DB

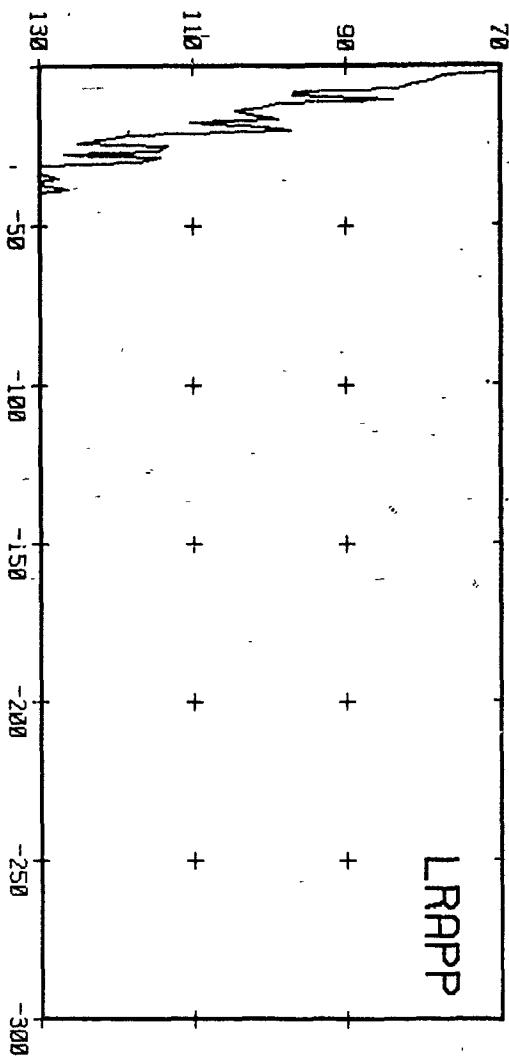
AKER 5 WINTER

S 50 R 300 F 300

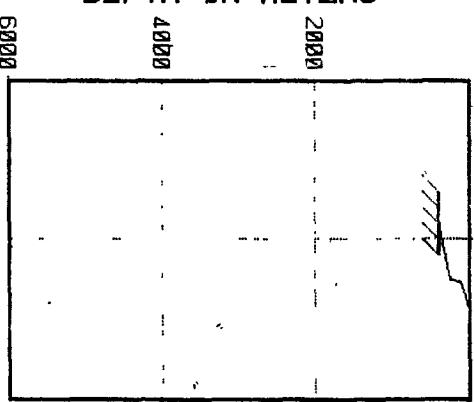
1450 M/S 1500 1550

LRAPP

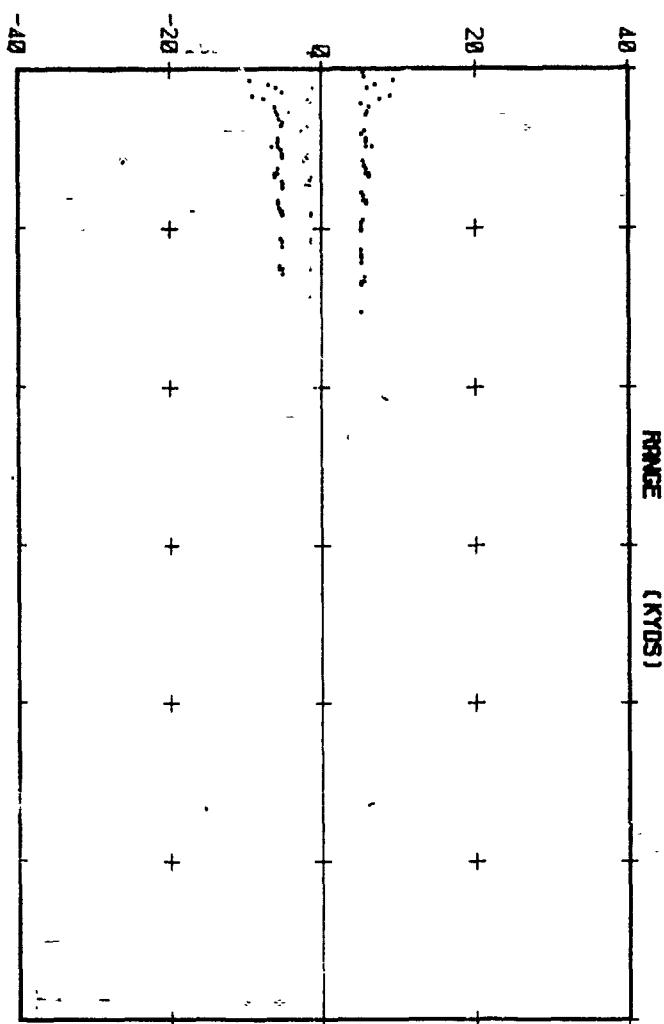
DB LOSS



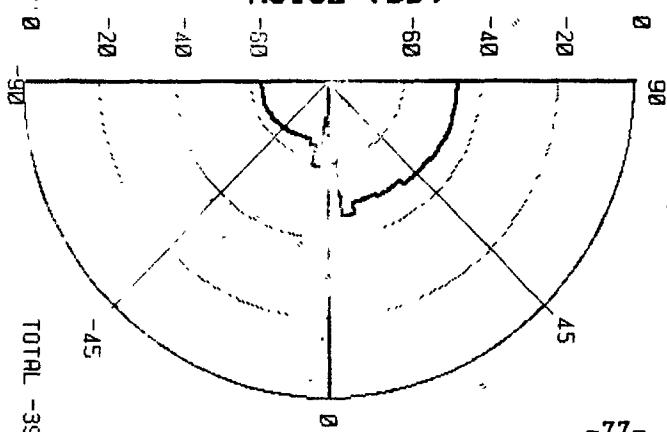
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



TOTAL - 39.7 DB

PAPER 5 WINTER

S 1020 R 365 F 360

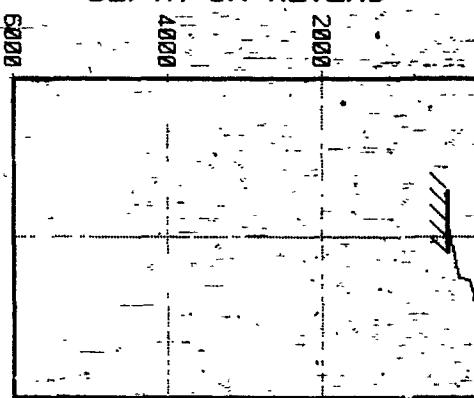
1450 M/S 1500 1550

LRAAPP

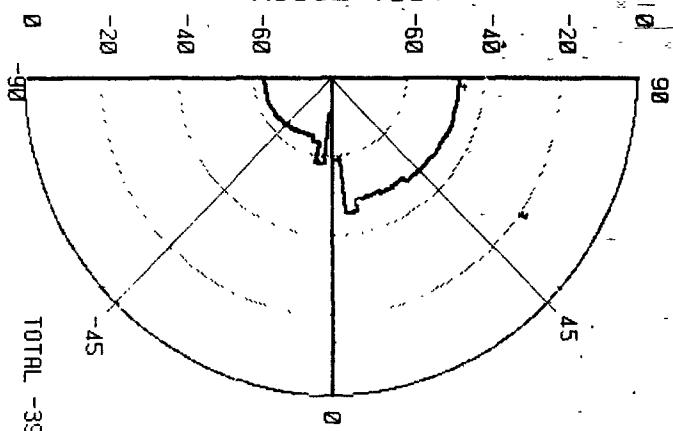
DB LOSS



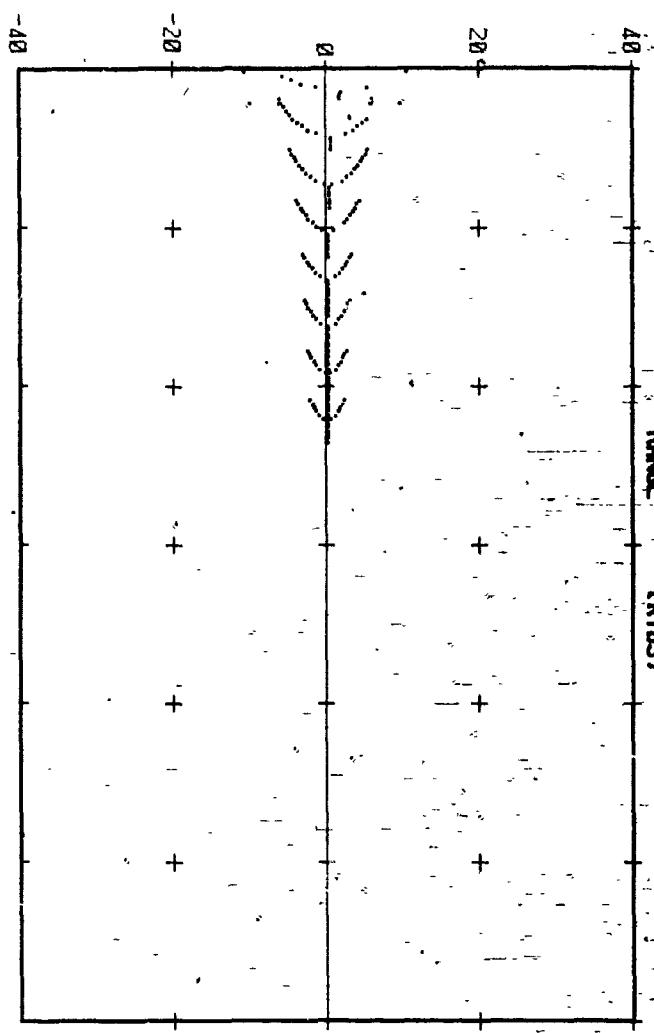
DEPTH IN METERS



NOISE (DB)



ARRIVAL ANGLE



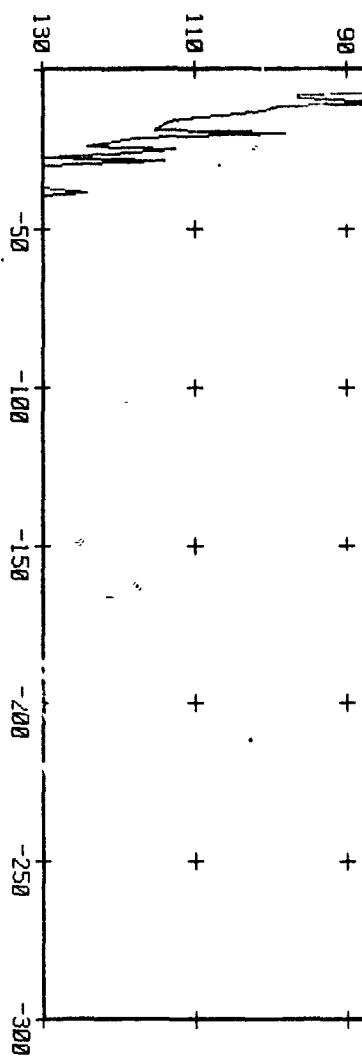
AKER 5 WINTER

S 20 R 328 F 300

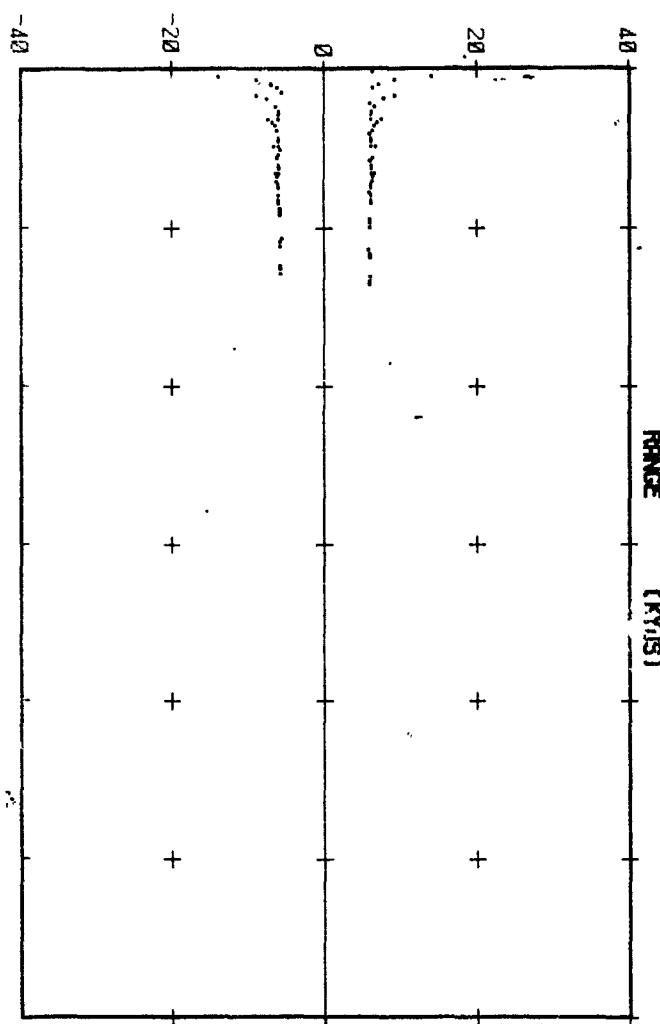
1450 M/S 1500 1550

LRAPP

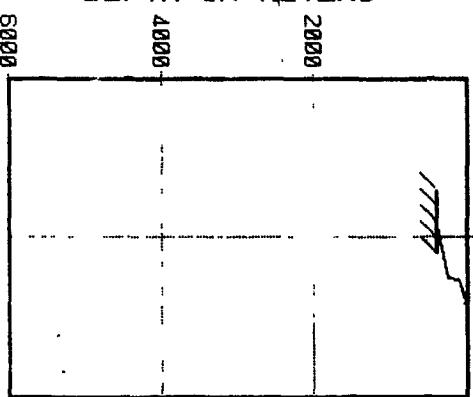
DB LOSS



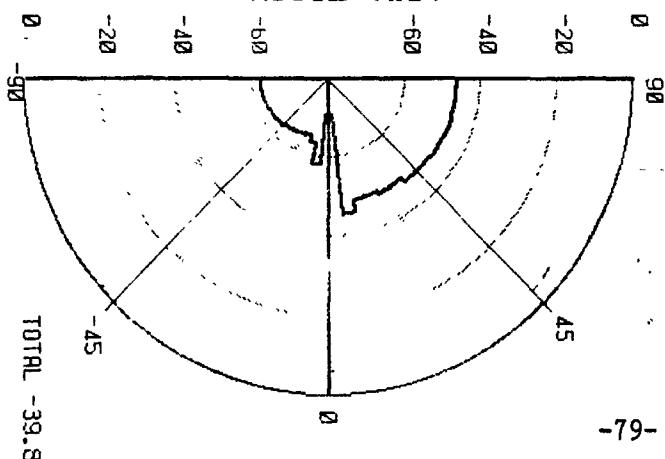
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -39.8 DB

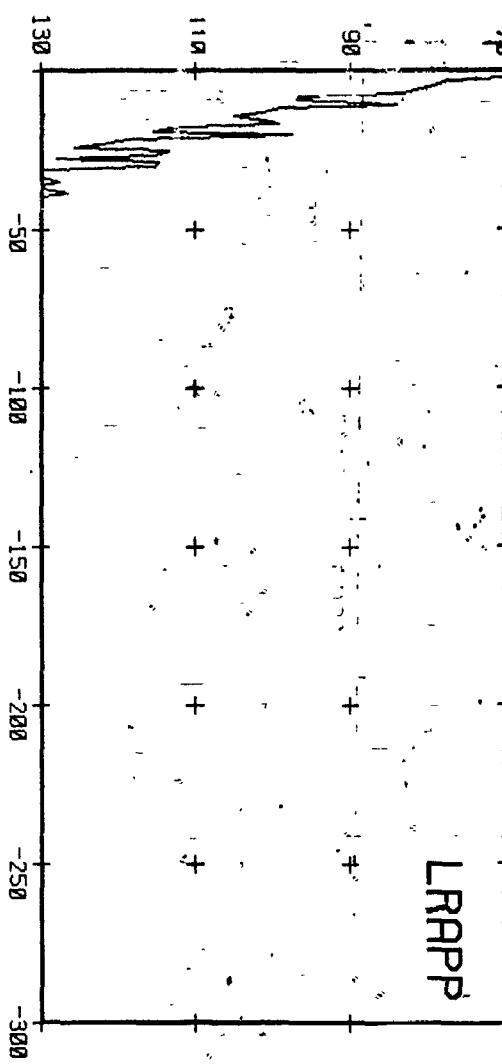
RER 5 WINTER

S 50 R 328 F 360

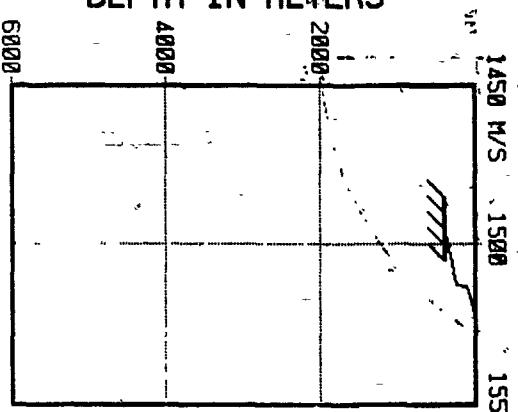
1450 MS 1500 1550

LRAPP

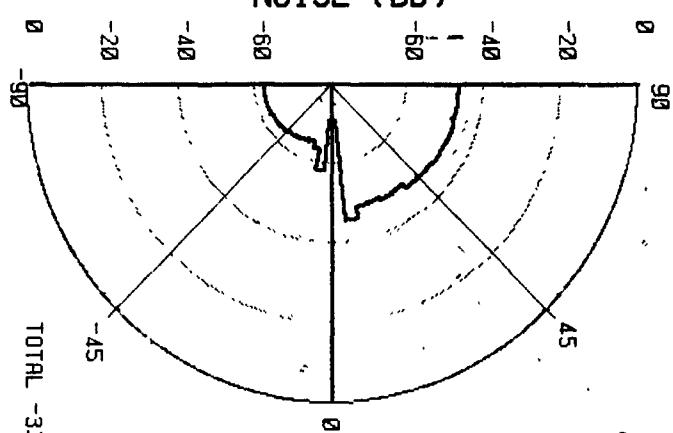
DB LOSS



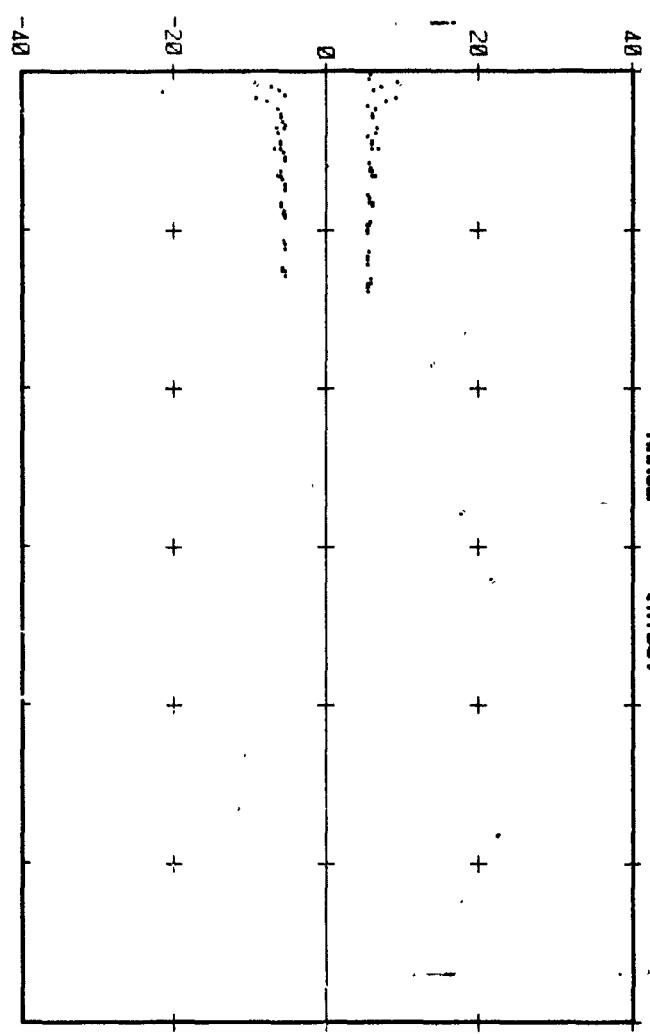
DEPTH IN METERS



NOISE (DB)



ARRIVAL ANGLE



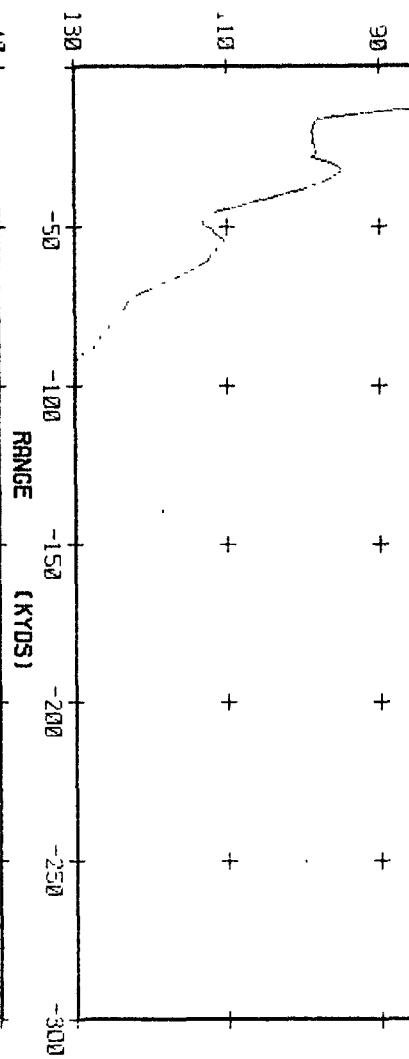
AREA 5 WINTER

S 1020 R 328 F 300

1450 M/S 1500 1550

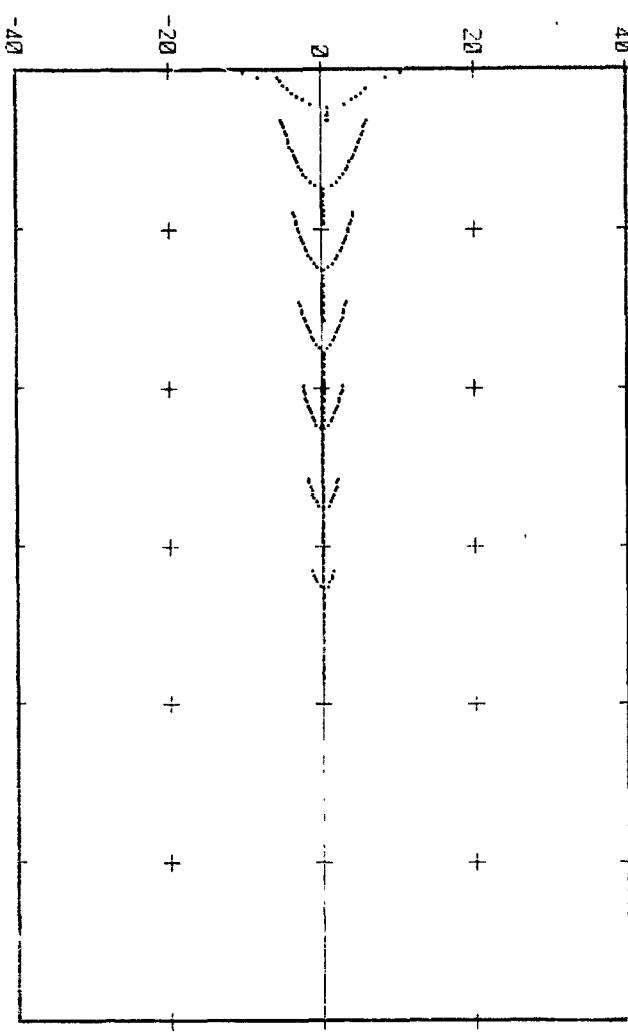
LRAPP

DB LOSS

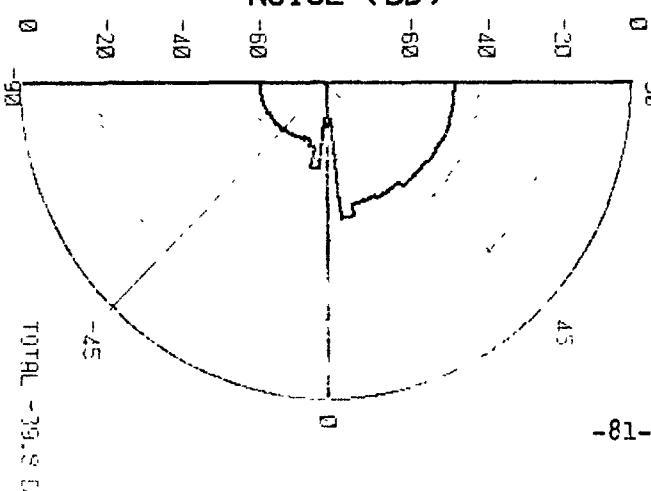


DEPTH IN METERS

ARRIVAL ANGLE



NOISE (DB)



-81-

AREA 5 WINTER

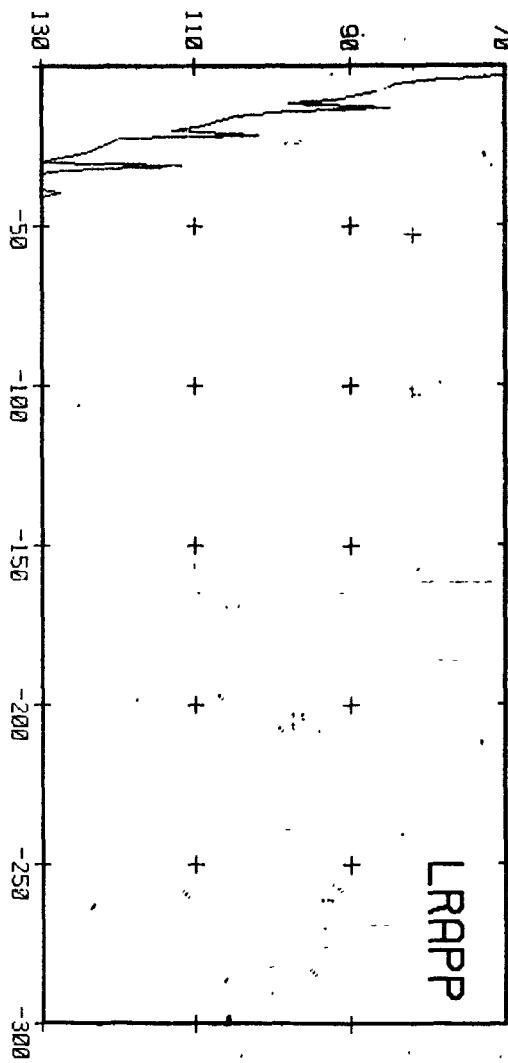
S 28 R 920 F 300

1450 M/S 1500

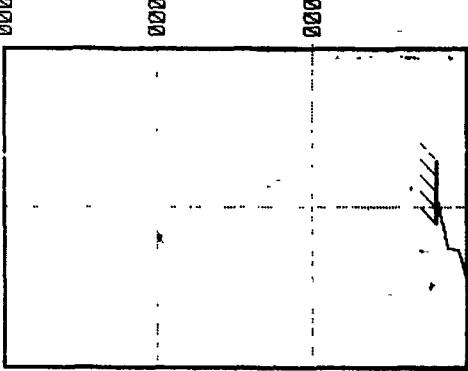
1550

LRAPP

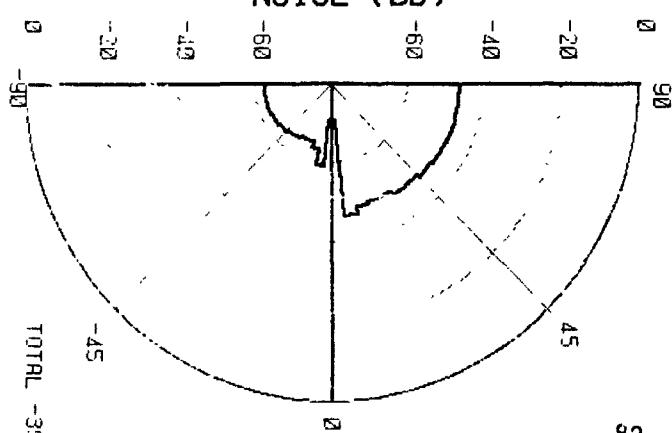
DB LOSS



DEPTH IN METERS



NOISE (DB)



70

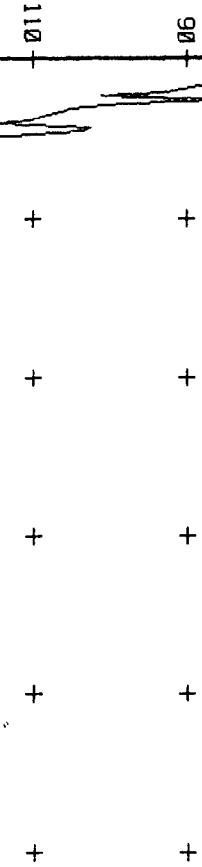
AREA 5 WINTER

S 58 R 920 F 388

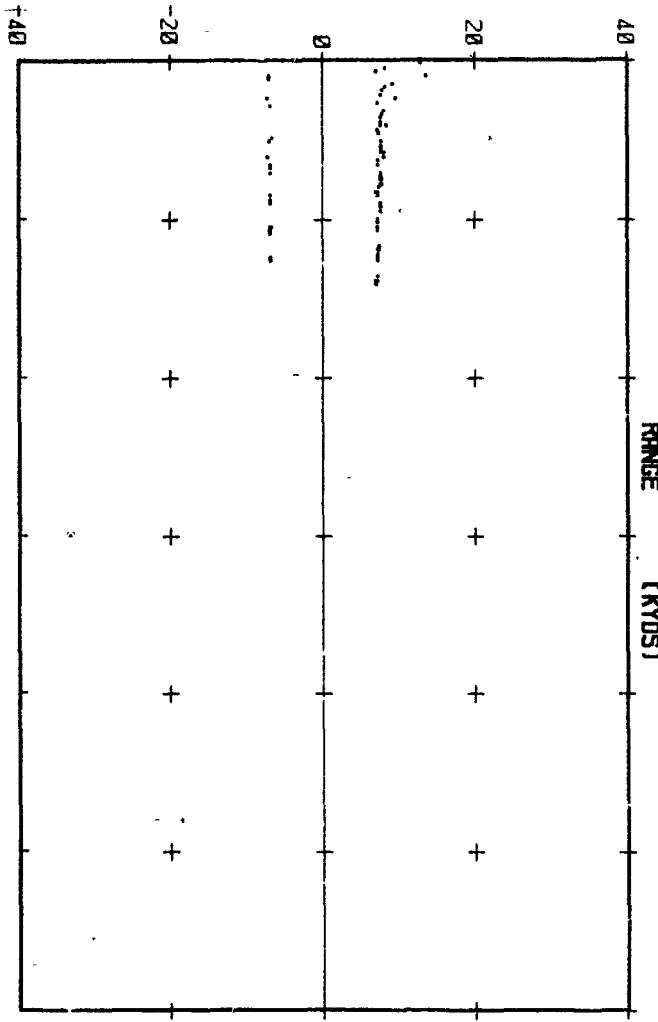
1450 M/S 1500 1550

LRAPP

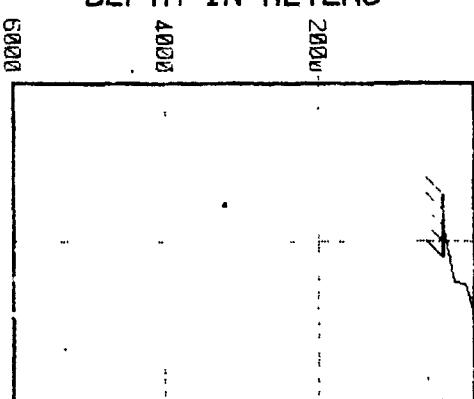
DB LOSS



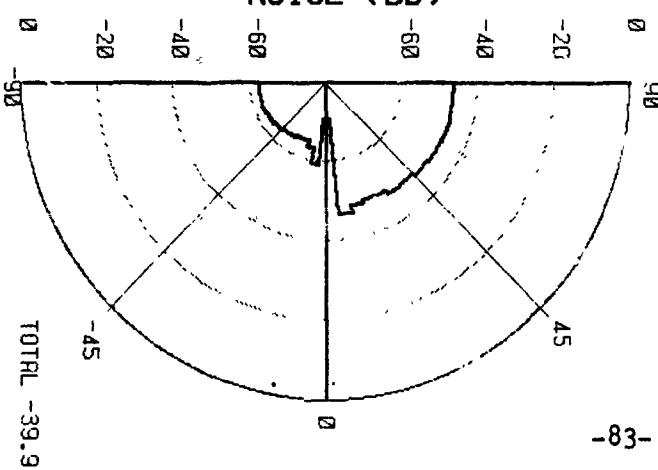
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -39.9 DB

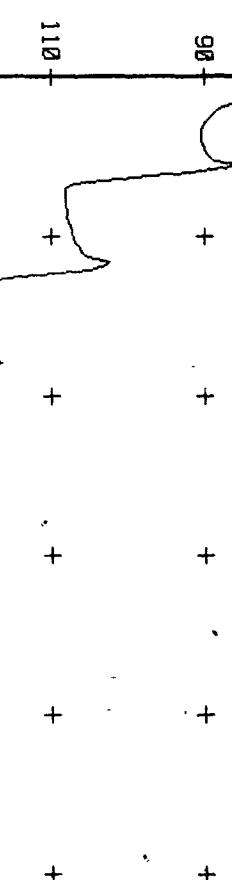
70

ARR 5 WINTER

S 1020 R 920 F 360

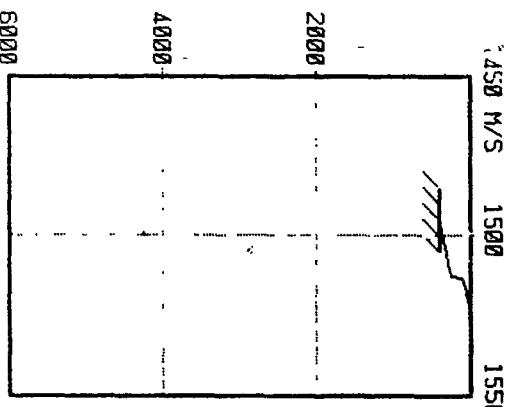
1450 M/S 1500 1550

DB LOSS

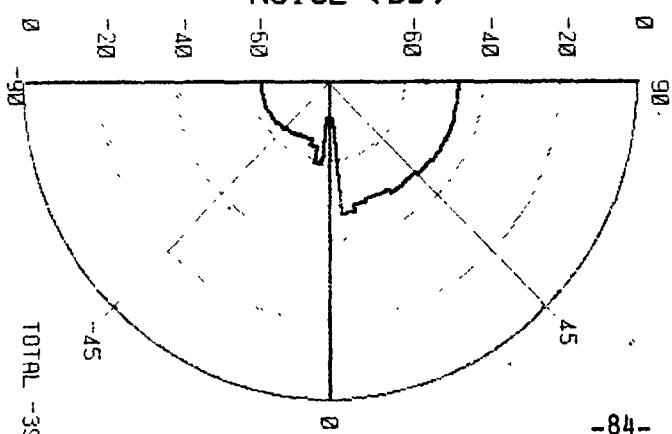


L RAPP

DEPTH IN METERS



NOISE (DB)



TOTAL -39.9 DB

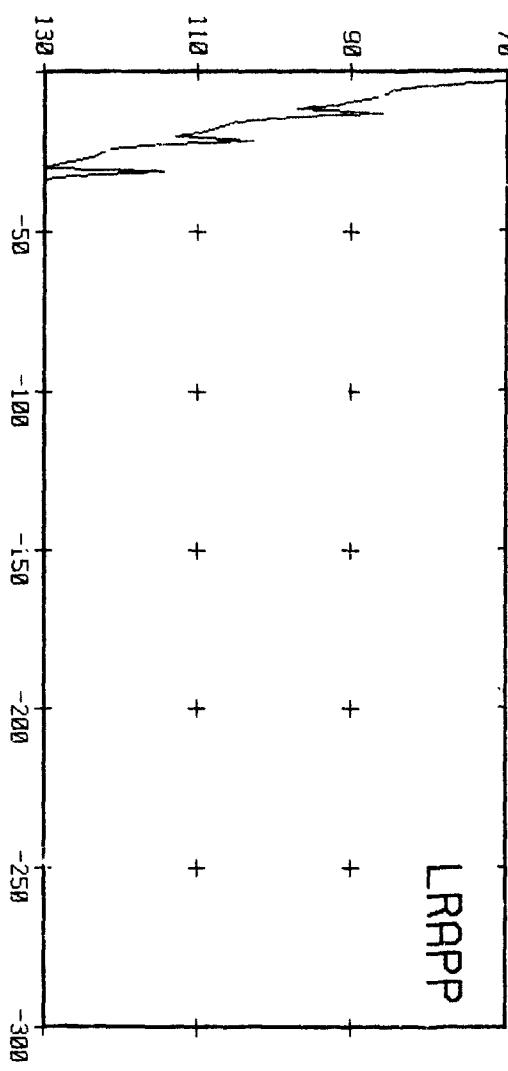
AREA 5 WINTER

S 28 R 1000 F 300

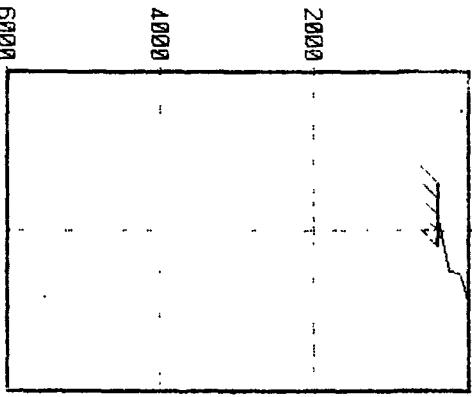
1450 M/S 1500 1550

LRAPP

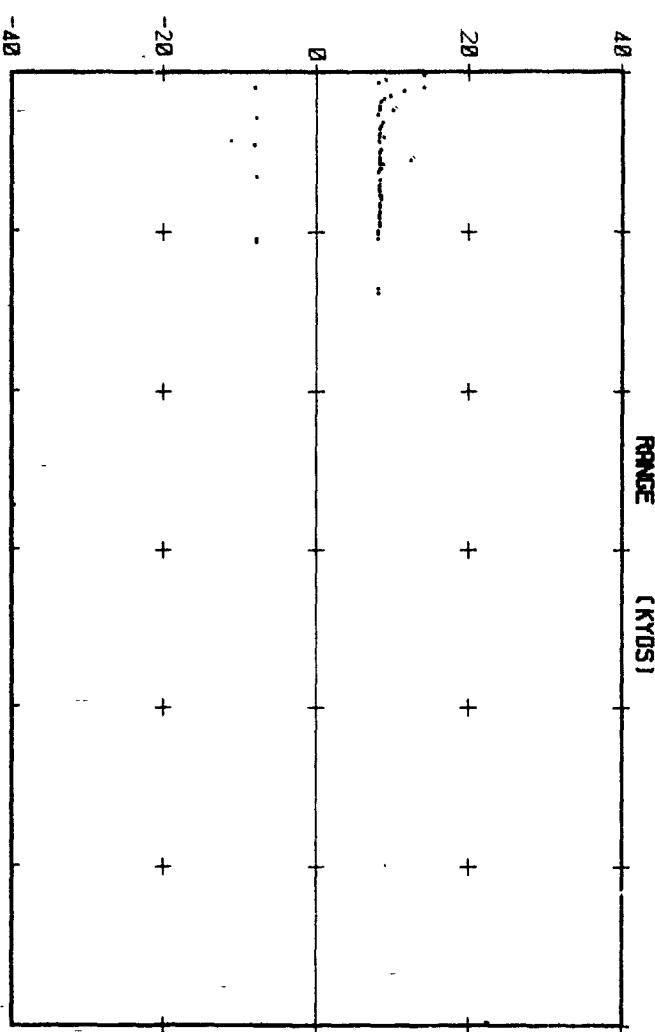
DB LOSS



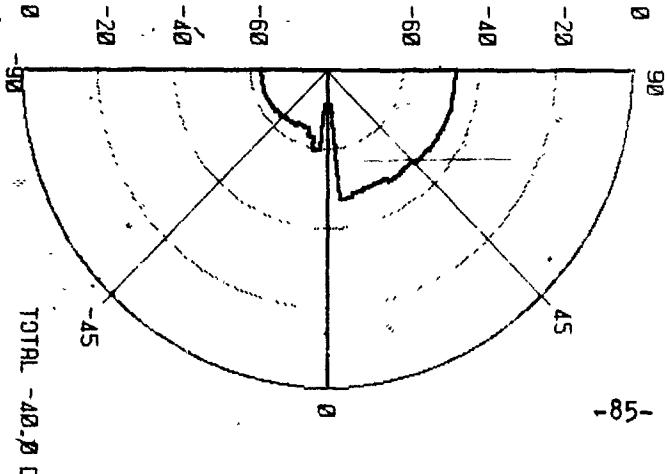
DEPTH IN METERS



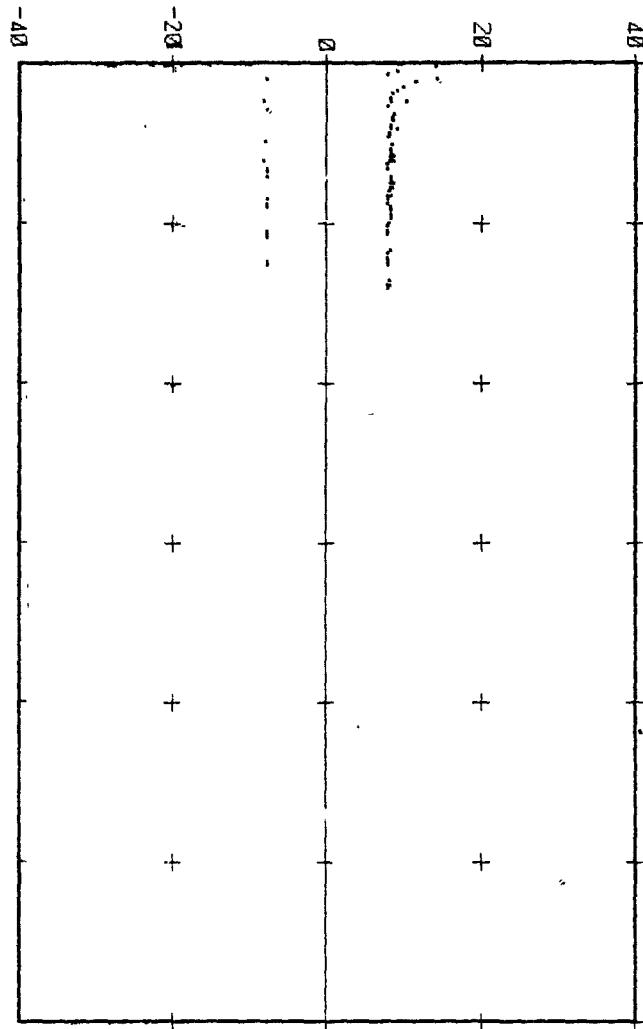
ARRIVAL ANGLE



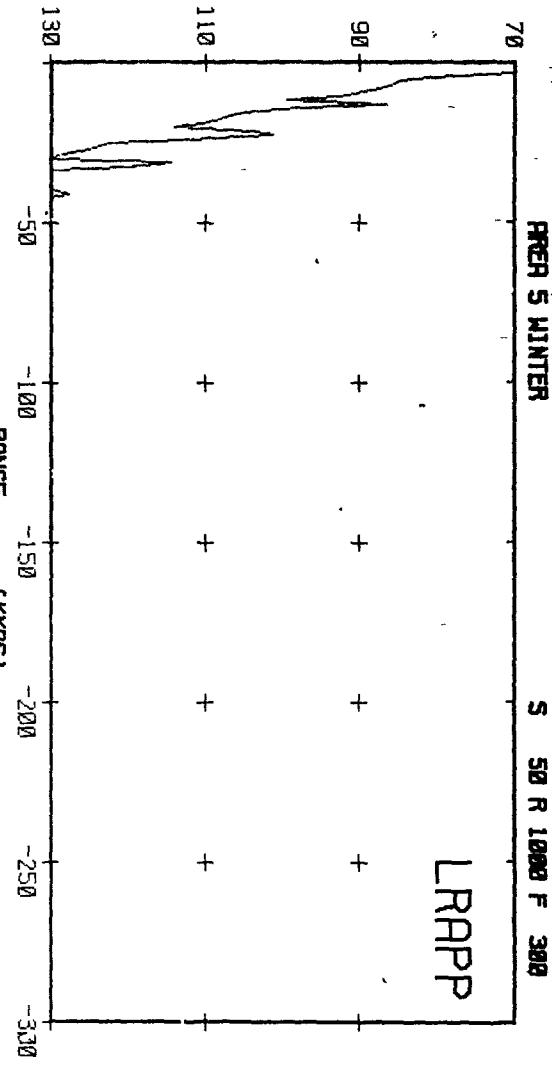
NOISE (DB)



ARRIVAL ANGLE



DB LOSS



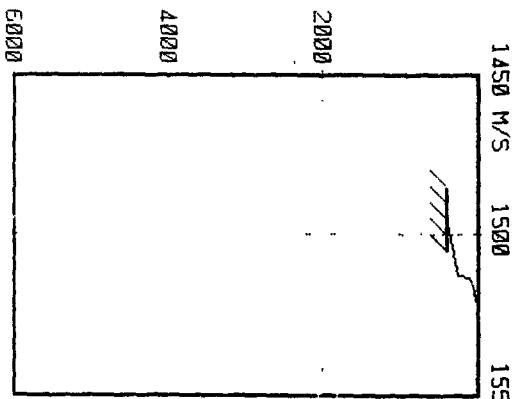
LRAPP

AREA 5 WINTER

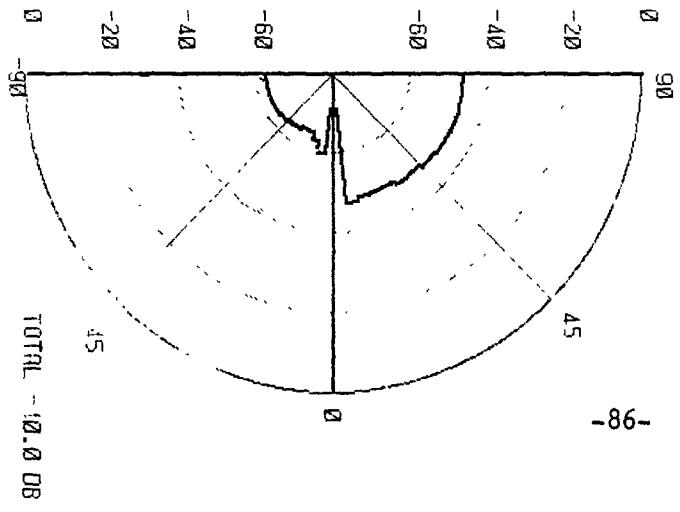
S 50 R 1000 F 300

1450 M/S 1500 1550

DEPTH IN METERS



NOISE (DB)



74

AREA 5 WINTER

S 1020 R 1000 F 300

1450 M/S 1500 1550

LRAPP

DB LOSS

90

110

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

130
110
90
70
50
30
10

RANGE [KIOS]

0

2000

4000

6000

8000

10000

12000

14000

16000

18000

20000

22000

24000

26000

ARRIVAL ANGLE

-40

-20

0

20

40

60

80

100

120

140

160

180

200

220

240

260

280

300

320

340

360

380

400

420

440

460

480

500

520

540

560

580

600

620

640

660

680

700

720

740

760

780

800

820

840

860

880

900

920

940

960

980

1000

1020

1040

1060

1080

1100

1120

1140

1160

1180

1200

1220

1240

1260

1280

1300

1320

1340

1360

1380

1400

1420

1440

1460

1480

1500

1520

1540

1560

1580

1600

1620

1640

1660

1680

1700

1720

1740

1760

1780

1800

1820

1840

1860

1880

1900

1920

1940

1960

1980

2000

2020

2040

2060

2080

2100

2120

2140

2160

2180

2200

2220

2240

2260

2280

2300

2320

2340

2360

2380

2400

2420

2440

2460

2480

2500

2520

2540

2560

2580

2600

2620

2640

2660

2680

2700

2720

2740

2760

2780

2800

2820

2840

2860

2880

2900

2920

2940

2960

2980

3000

3020

3040

3060

3080

3100

3120

3140

3160

3180

3200

3220

3240

3260

3280

3300

3320

3340

3360

3380

3400

3420

3440

3460

3480

3500

3520

3540

3560

3580

3600

3620

3640

3660

3680

3700

3720

3740

3760

3780

3800

3820

3840

3860

3880

3900

3920

3940

3960

3980

4000

4020

4040

4060

4080

4100

4120

4140

4160

4180

4200

4220

4240

4260

4280

4300

4320

4340

4360

4380

4400

4420

4440

4460

4480

4500

4520

4540

4560

4580

4600

4620

4640

4660

4680

4700

4720

4740

4760

4780

4800

4820

4840

4860

4880

4900

4920

4940

4960

4980

5000

5020

5040

5060

5080

5100

5120

5140

5160

5180

5200

5220

5240

5260

5280

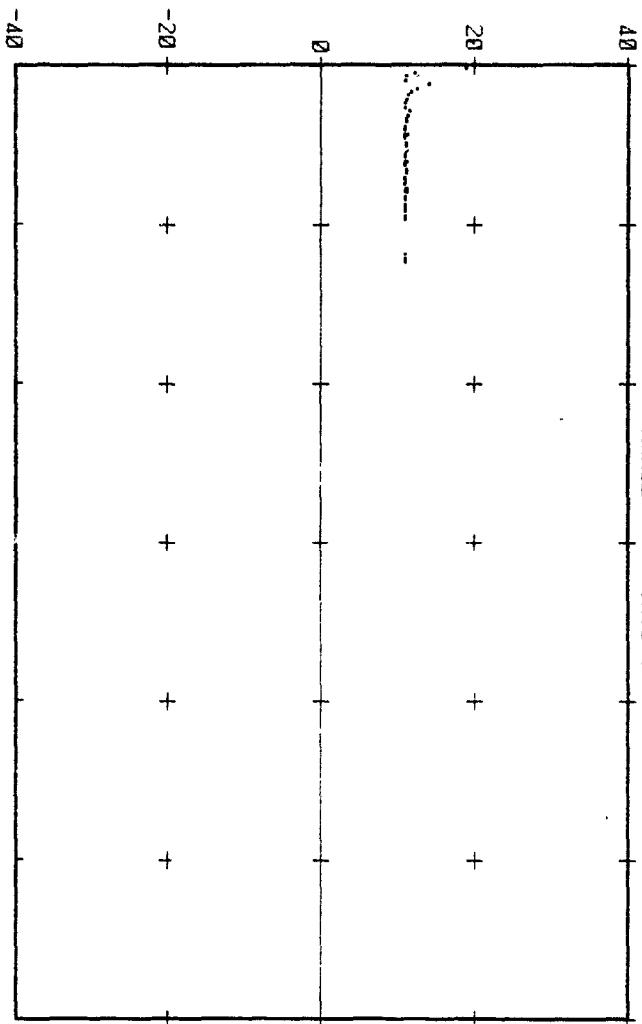
5300

5320

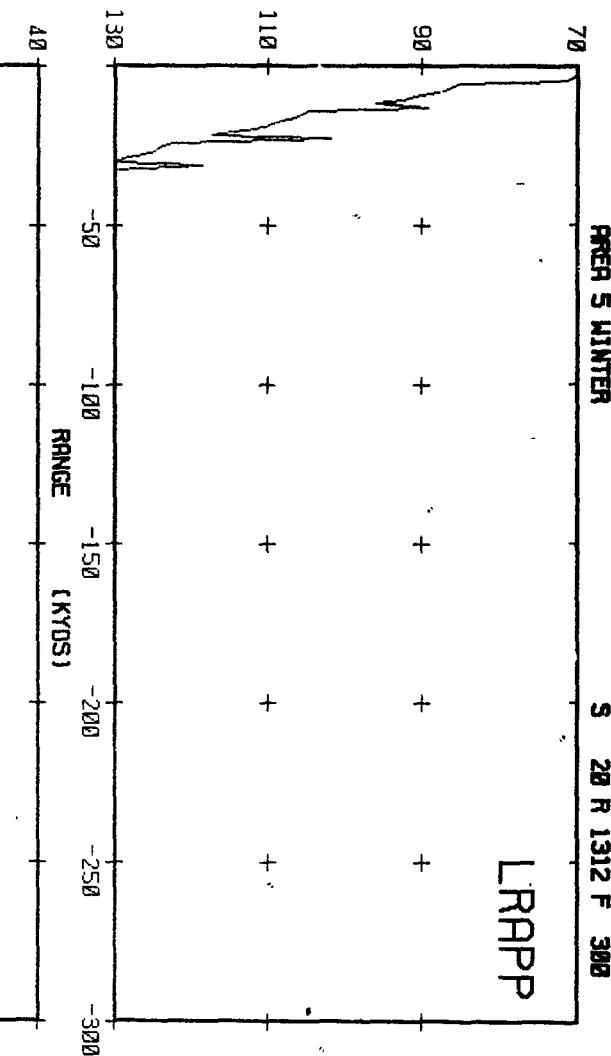
5340

5360

ARRIVAL ANGLE



DB LOSS

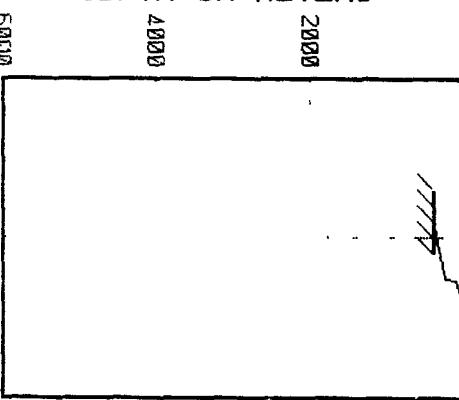


L RAPP

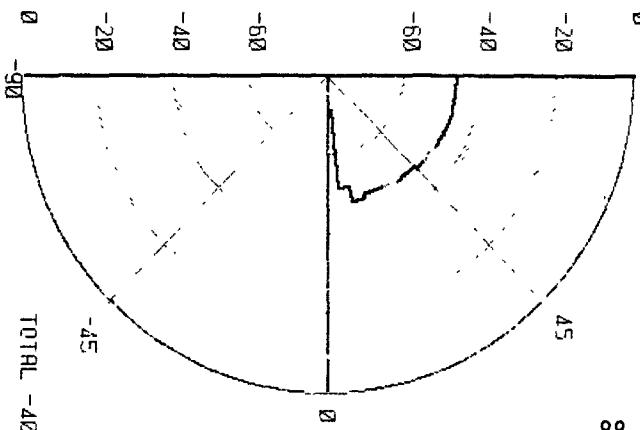
AREA 5 WINTER S 20 R 1312 F 300

1450 M/S 1500 1550

DEPTH IN METERS



NOISE (DB)



TOTAL -40.3 dB

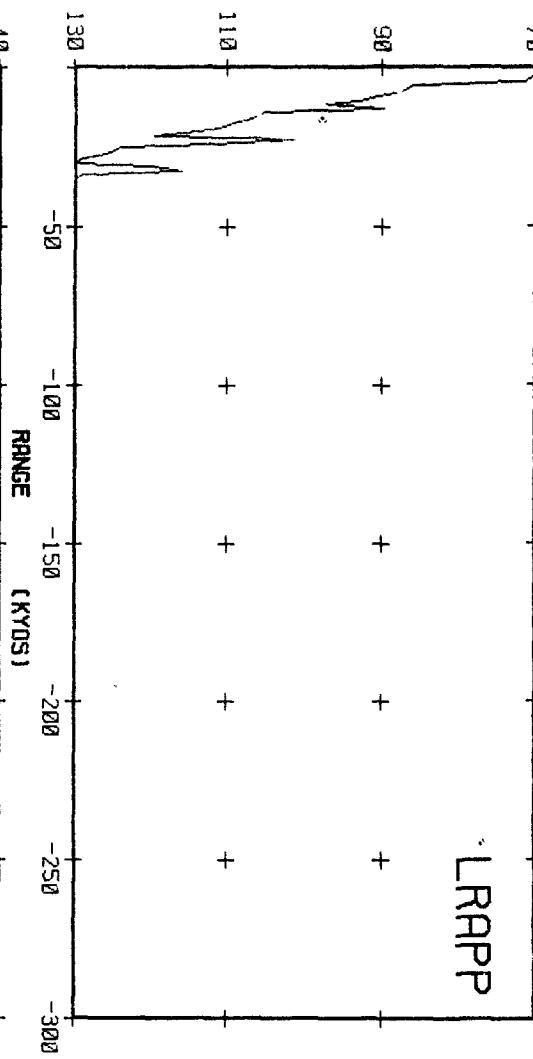
AKER 5 WINTER

S 50 R 1312 F 382

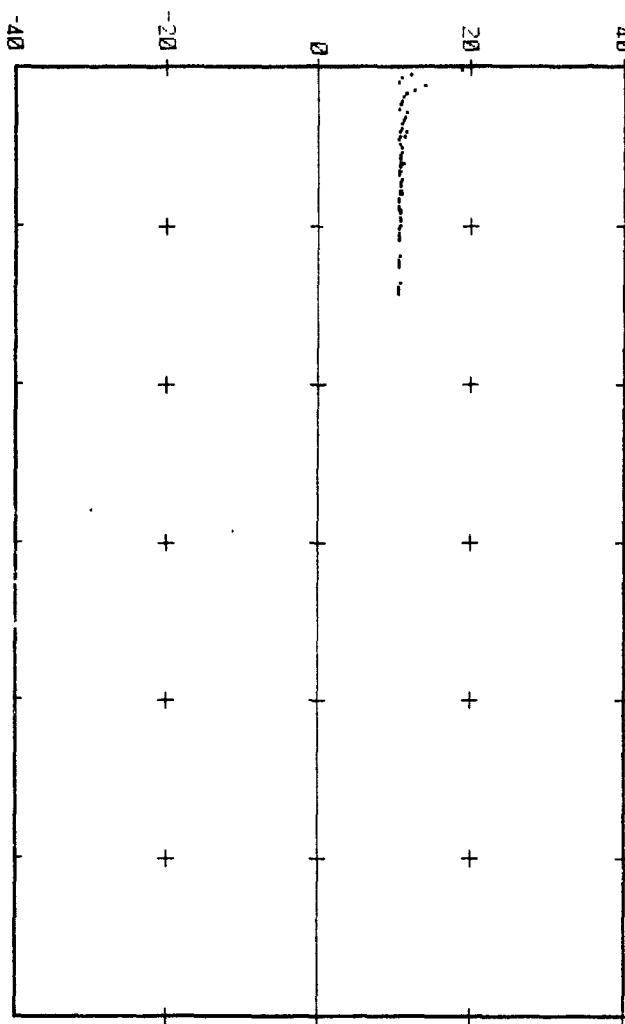
1450 M/S 1500 1550

LRAPP

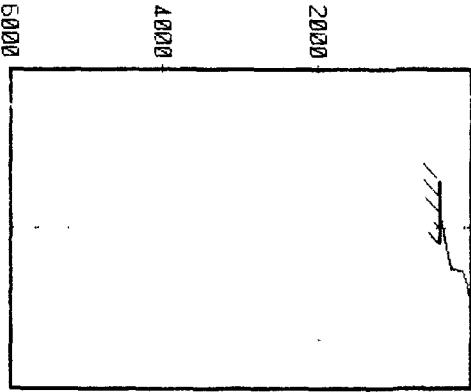
DB LOSS



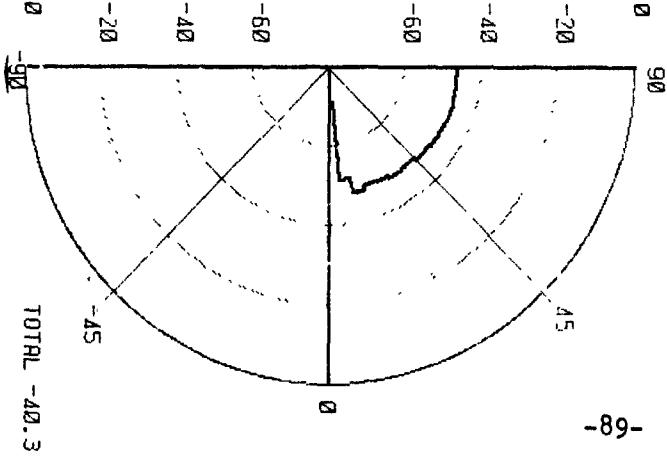
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



-89-

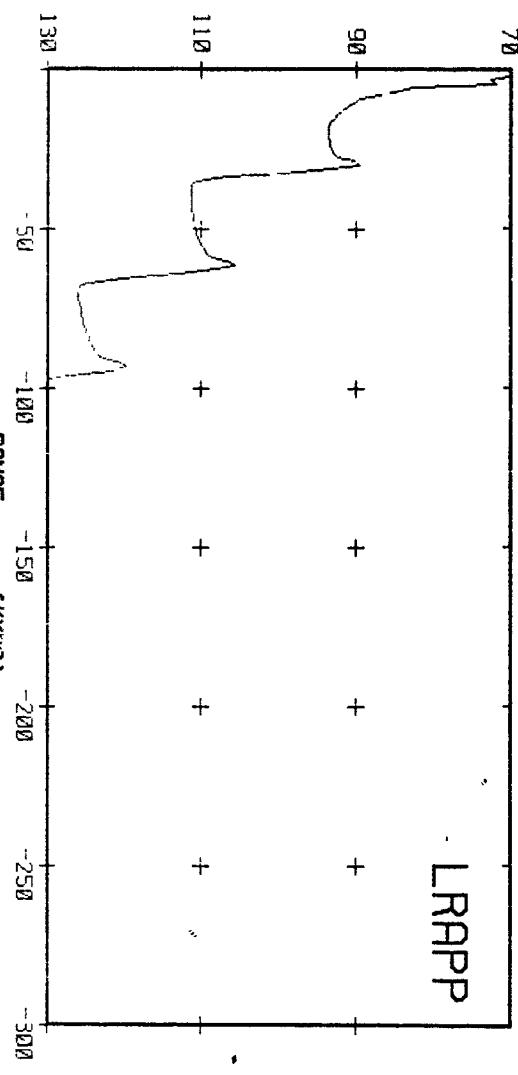
RER 5 WINTER

S 1020 R 1312 F 300

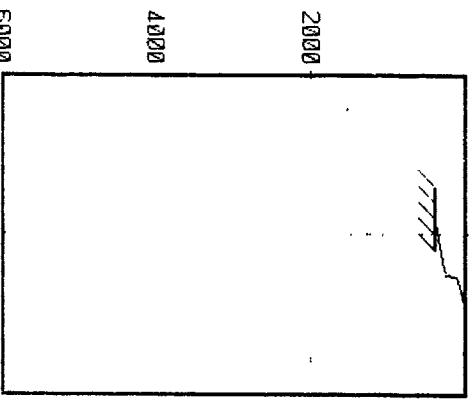
1450 M/S 1500 1550

LRAPP

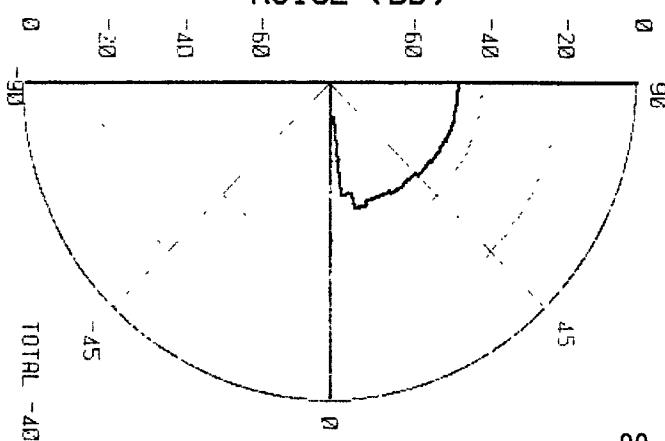
DB LOSS



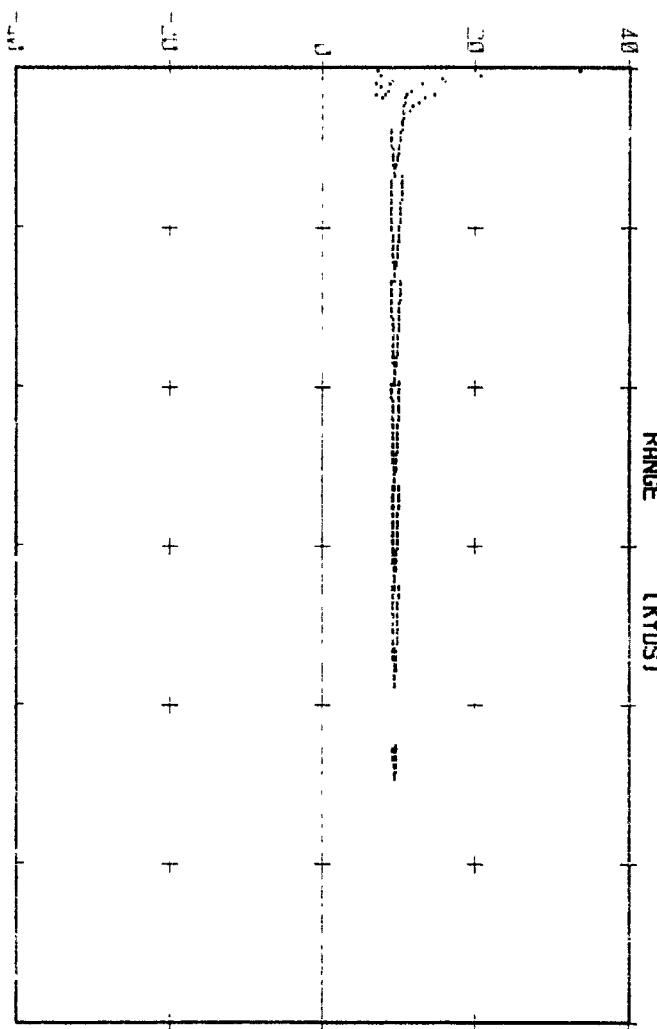
DEPTH IN METERS



NOISE (DB)



ARRIVAL ANGLE



PER 5 WINTER

S 20 R 60 F 500

1450 M/S 1500 1550

LRAPP

DB LOSS

90 + + + + +

+ +

110 + + + + +

+ +

130 50 100 150 200 250 300

RANGE (KILOMETERS)

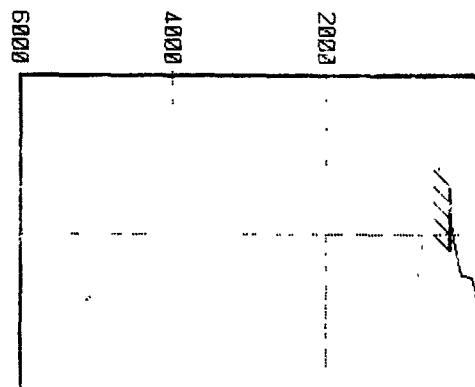
DEPTH IN METERS

2000

4000

6000

0 45 90



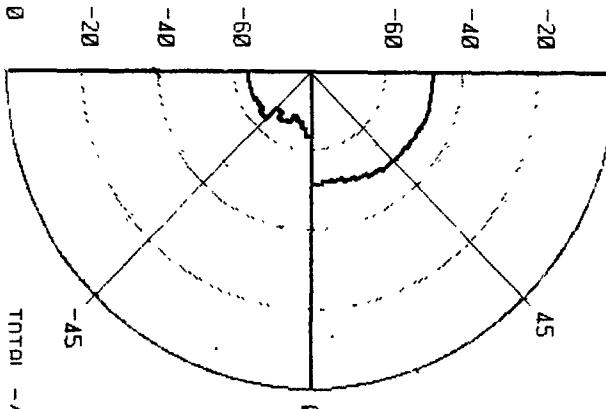
NOISE (DB)

-60 -40 -20 0

90

45

0



TOTAL -11 R NP

-91-

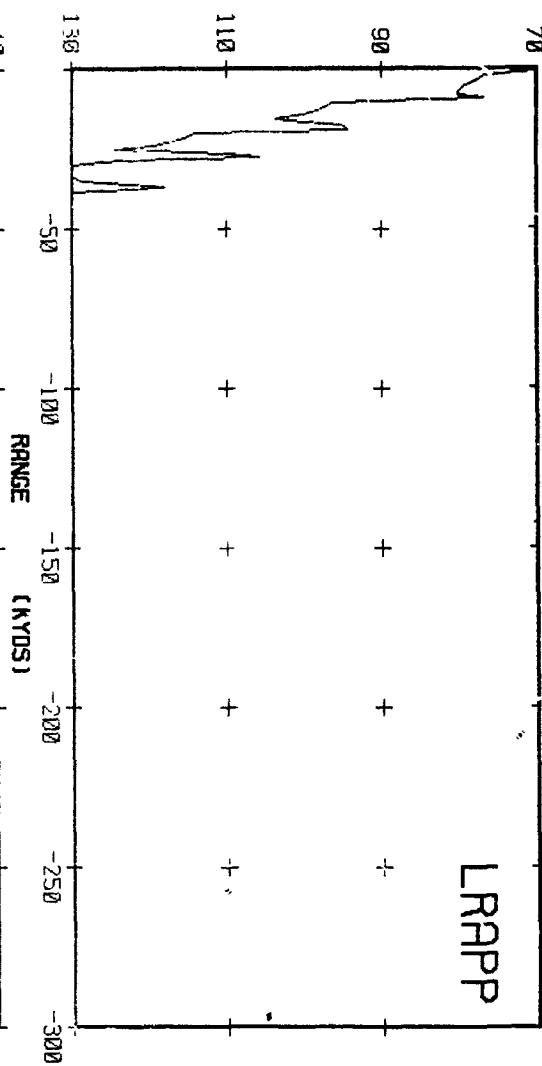
AREA 5 WINTER

S 50 R 60 F 600

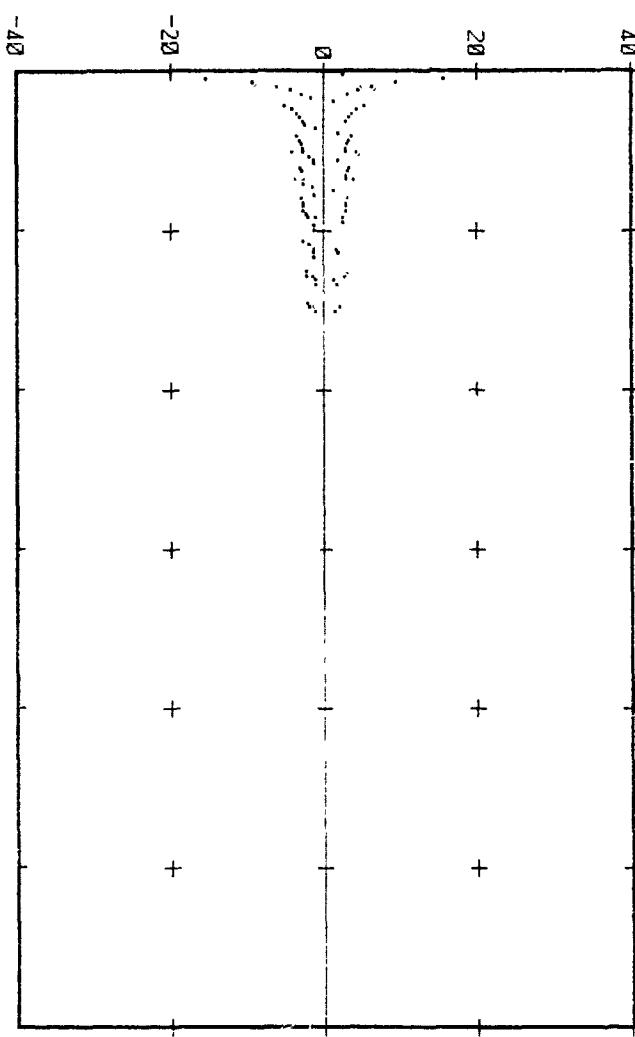
1450 M/S 1500 1550

L RAPP

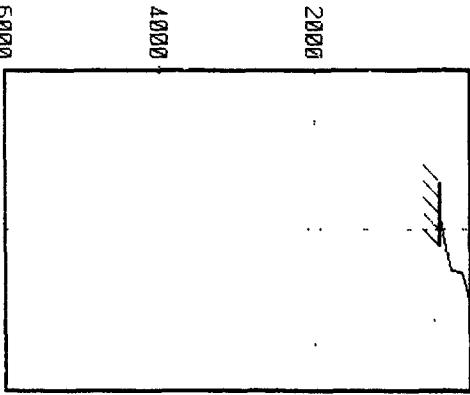
DB LOSS



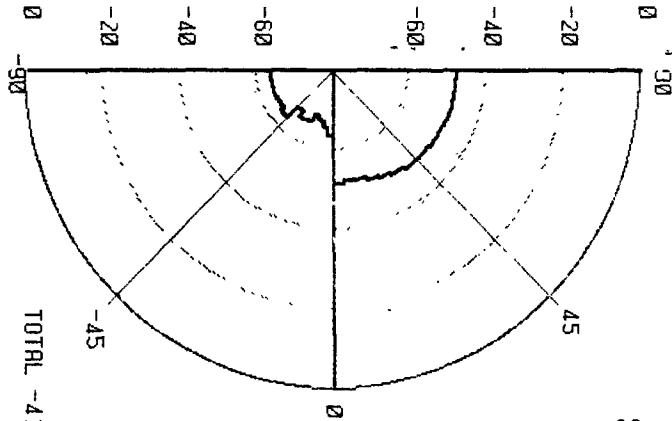
ARRIVAL ANGLE



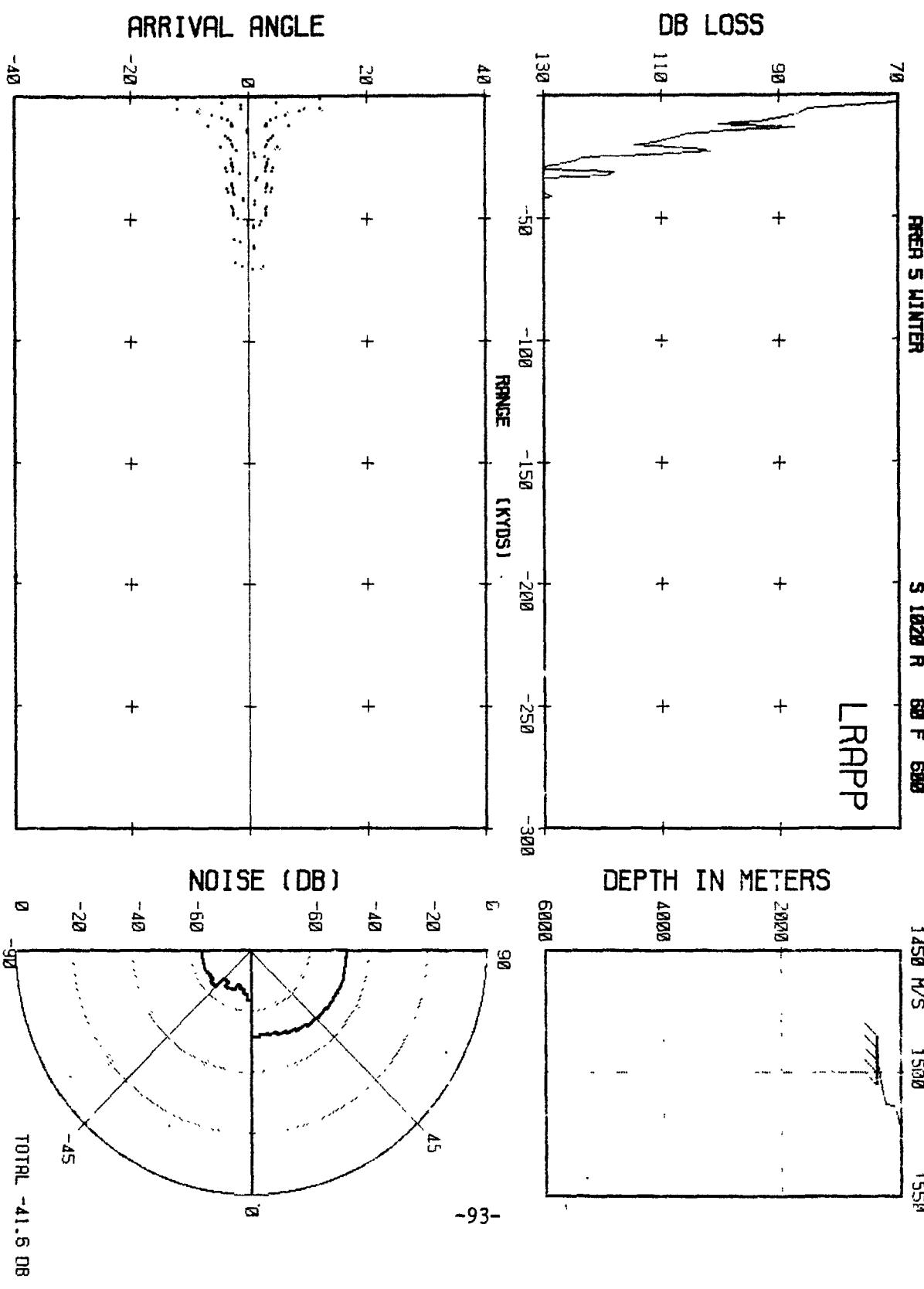
DEPTH IN METERS

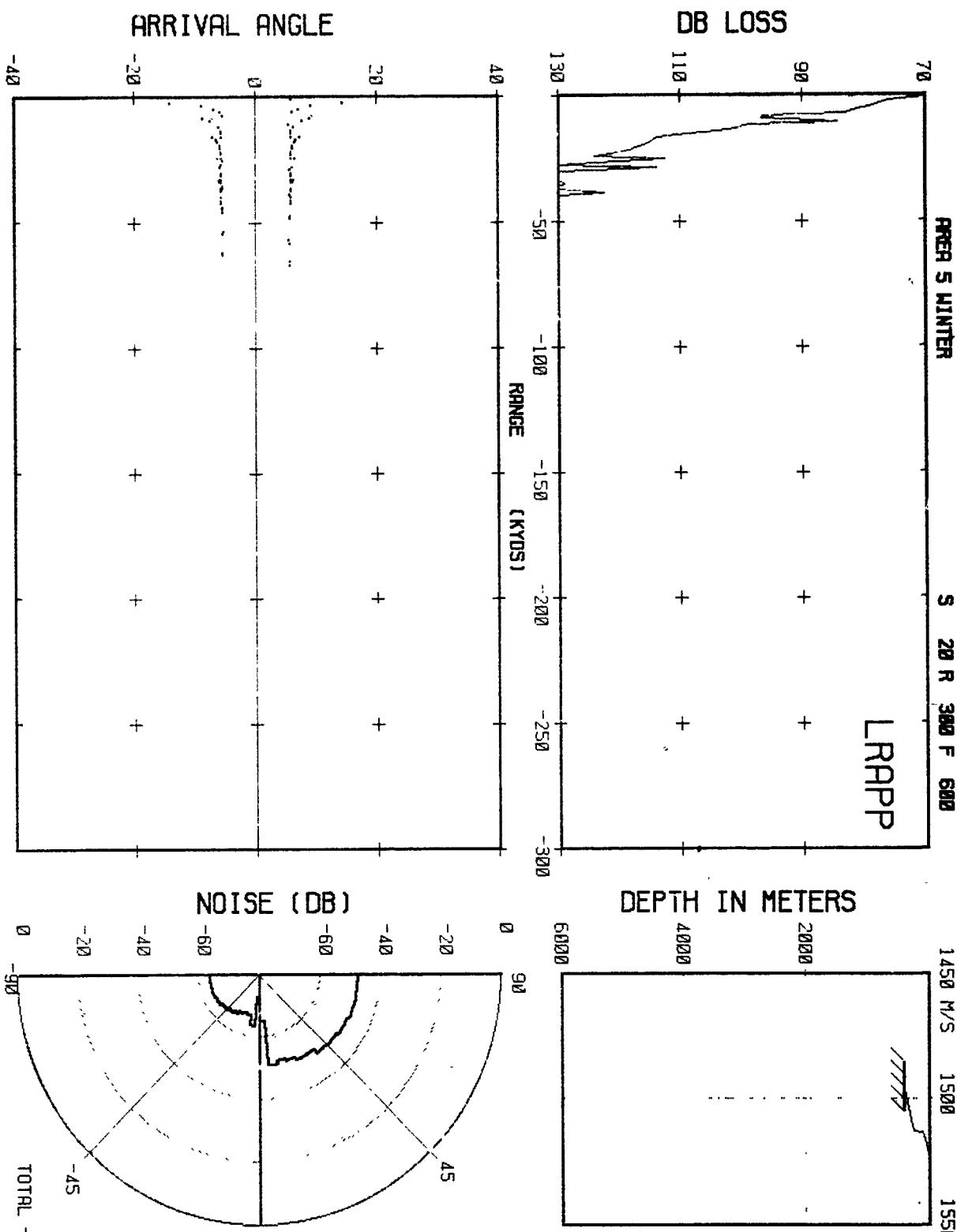


NOISE (DB)



H H H H H H H H H H H H H H H





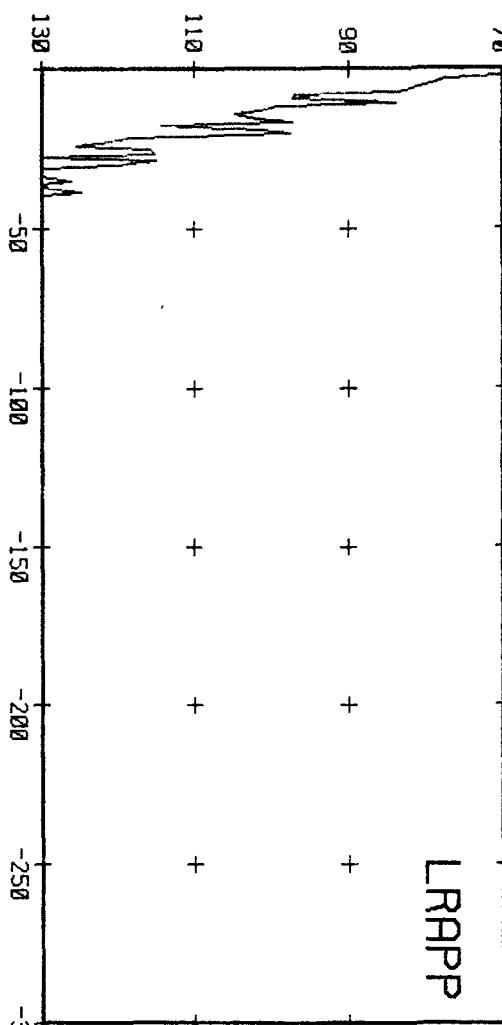
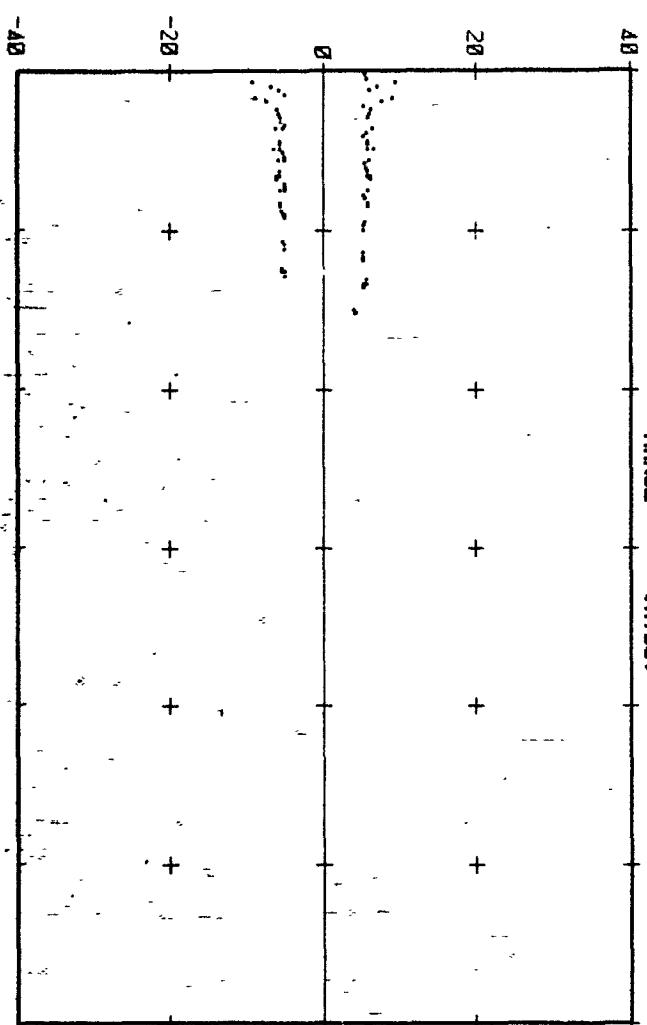


1

PREH 5 KUNTER

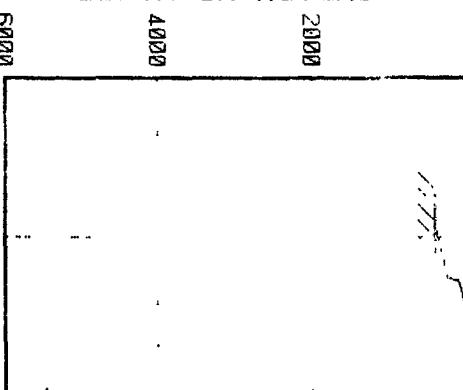
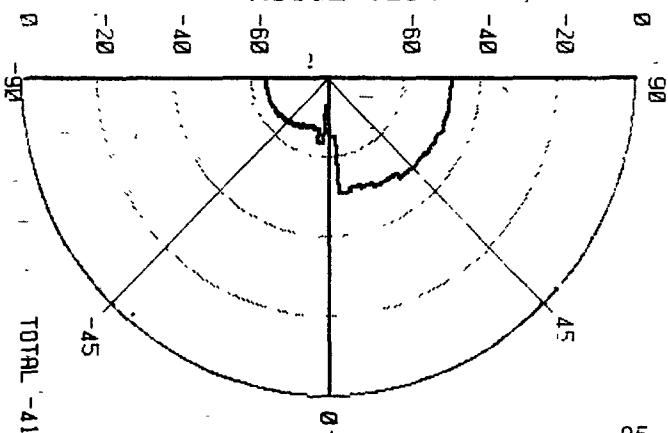
卷之三

卷之三

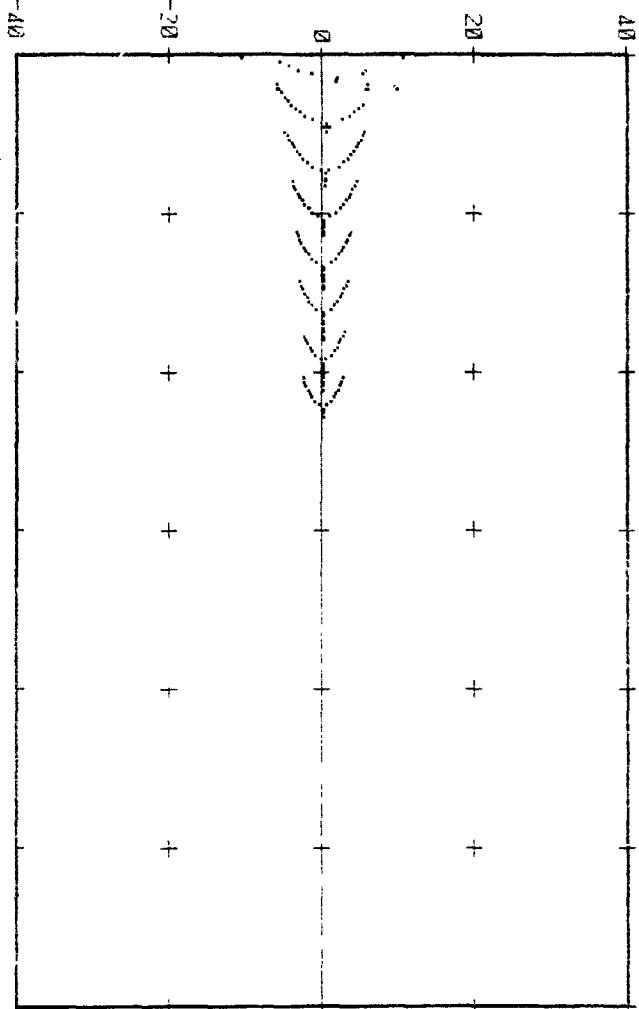


NOISE (DB)

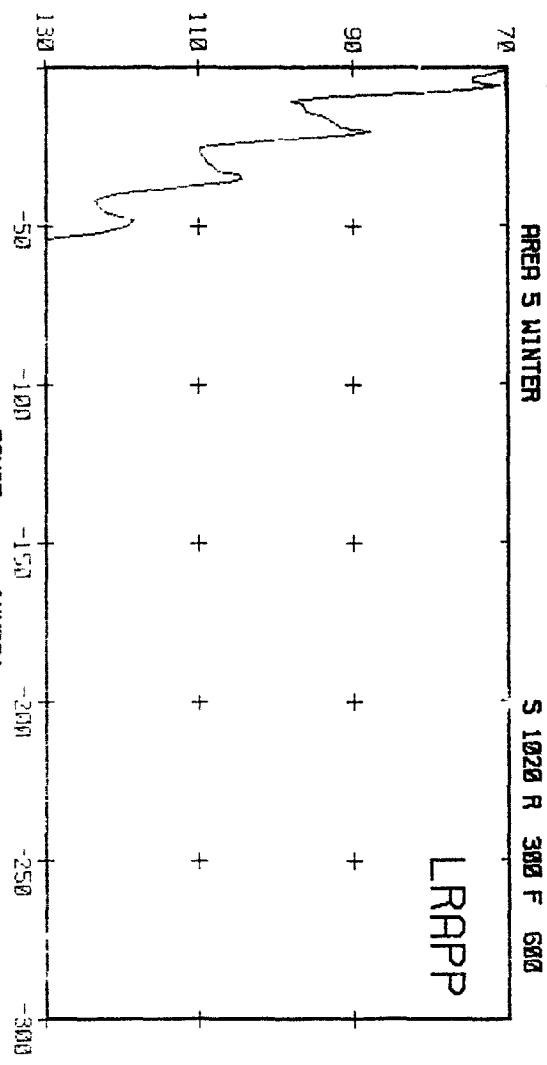
DEPTH IN METERS



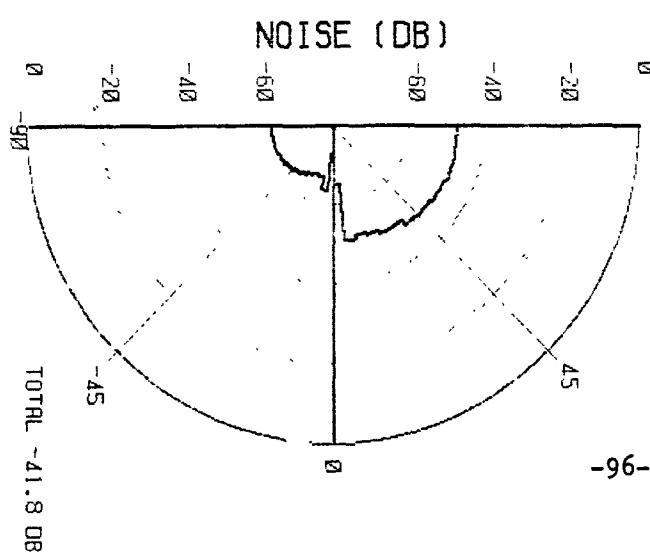
ARRIVAL ANGLE



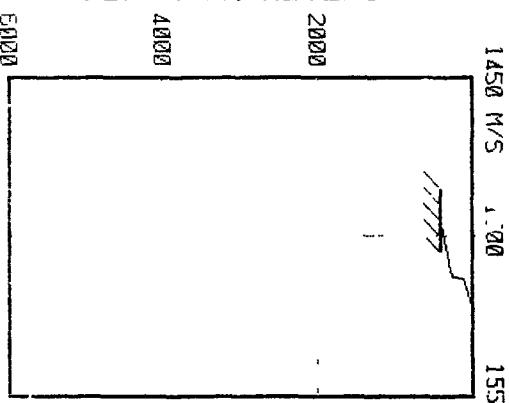
DB LOSS



LRAAPP



DEPTH IN METERS



TOTAL ~41.8 DB

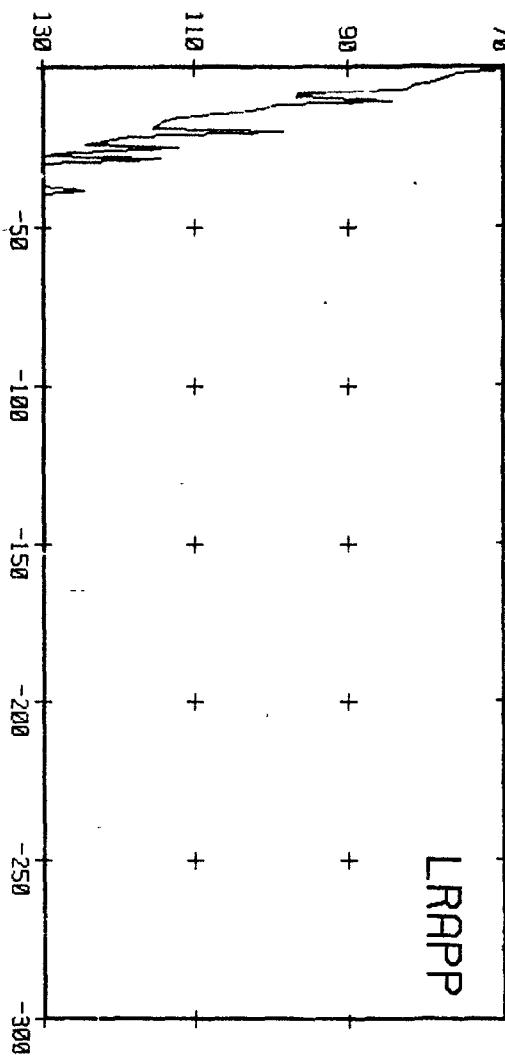
AREA 5 WINTER

S 20 R 328 F 680

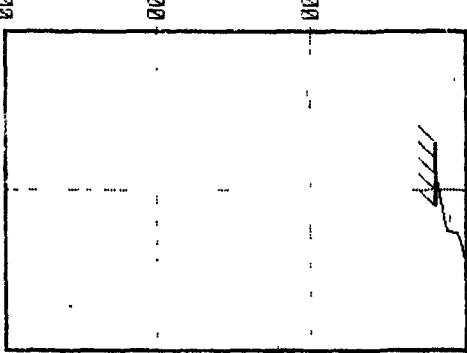
1450 M/S 1500 1550

L RAPP

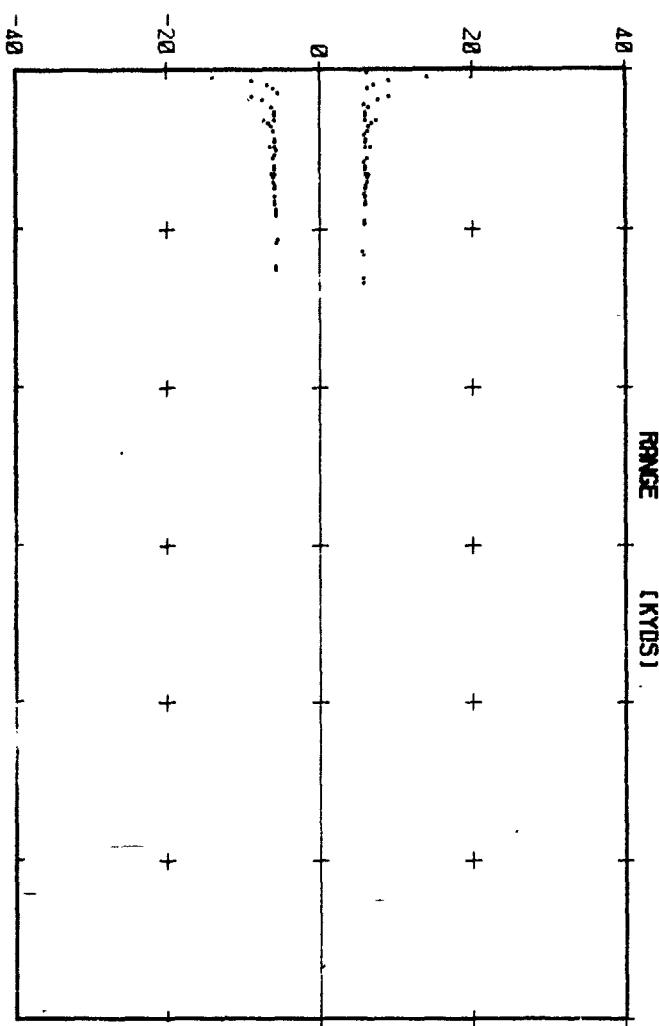
DB LOSS



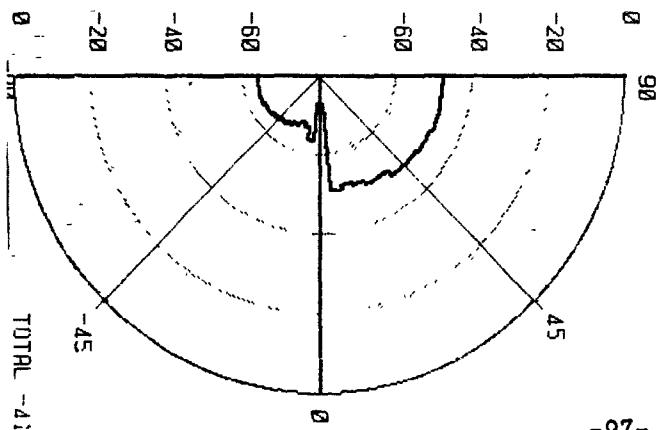
DEPTH IN METERS



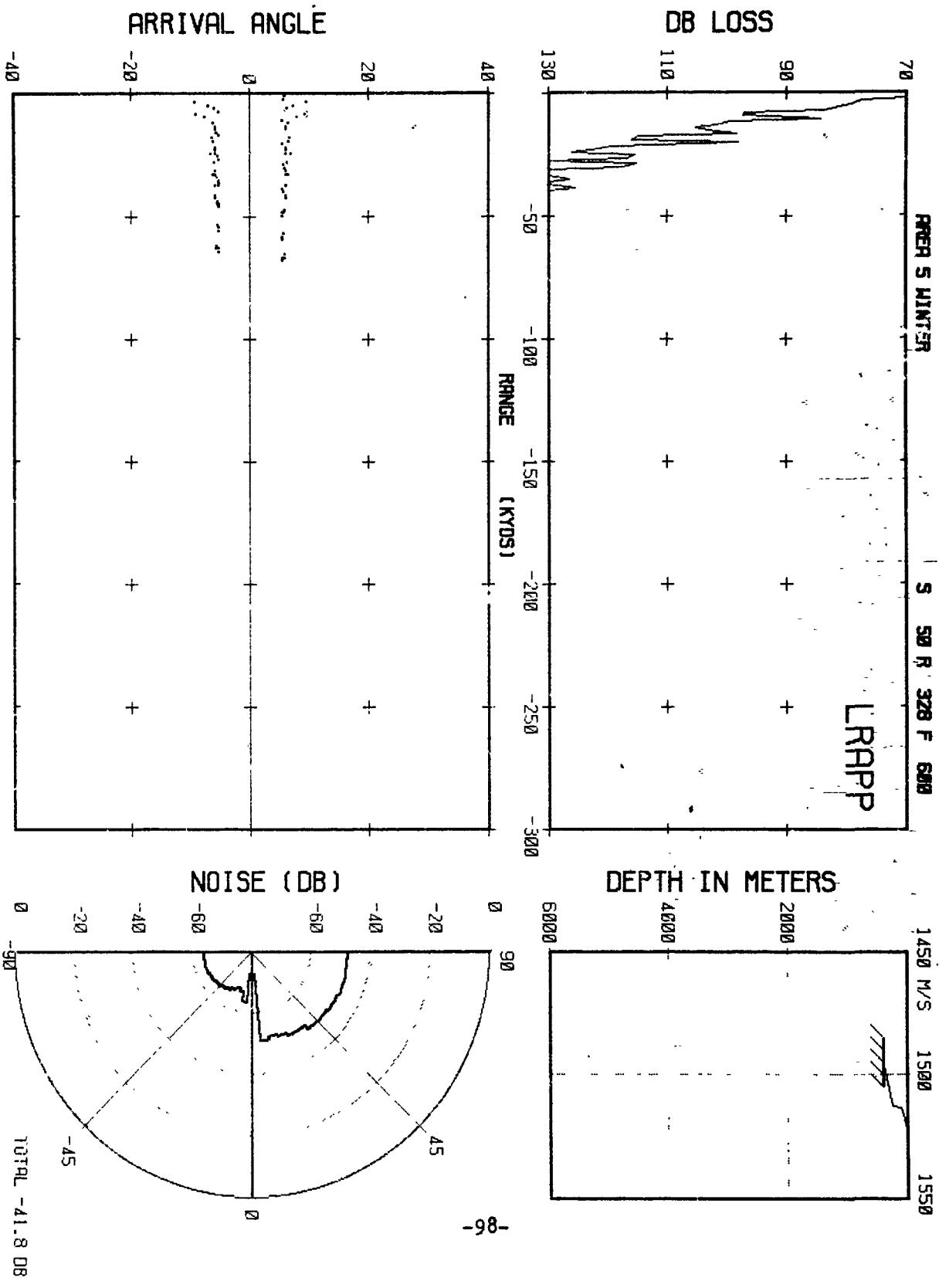
ARRIVAL ANGLE



NOISE (DB)



TOTAL -41.8 DB



70

AREA 5 WINTER

S 1020 R 328 F 600

1450 M/S 150M 155M

I RAPP

DB LOSS

90

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

DEPTH IN METERS

4000

3000

2000

1000

0

6000

5000

4000

3000

2000

1000

0

-

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

AKER 5 WINTER

S 28 R 920 F 600

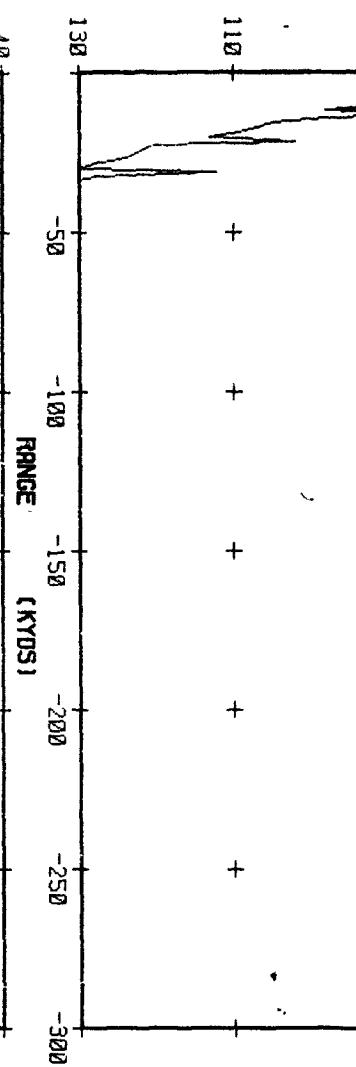
1450 M/S 1500 1550

LRAPP

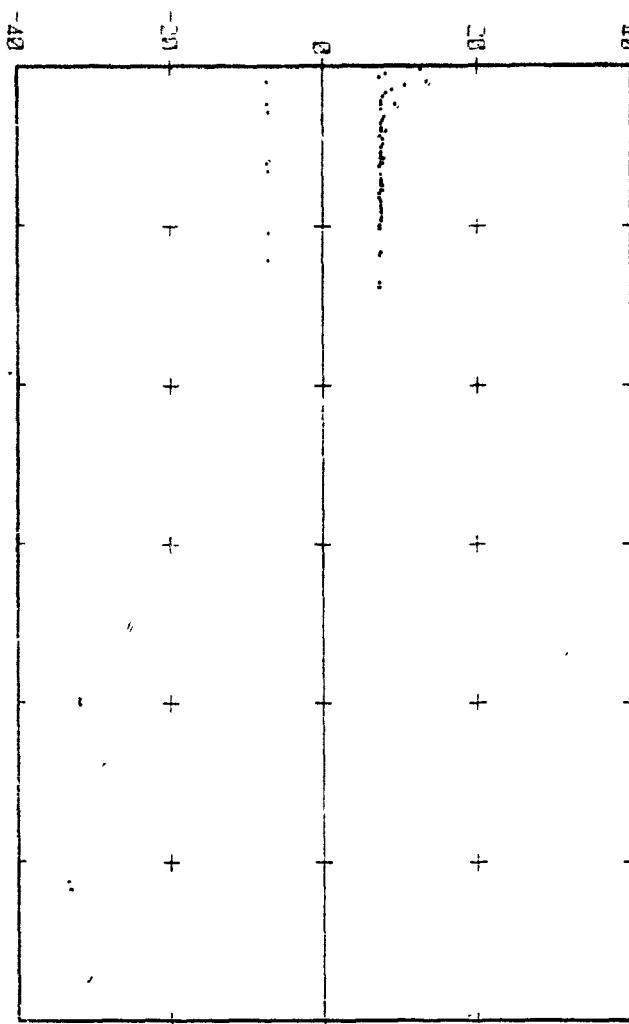
DB LOSS

90 + + + + +

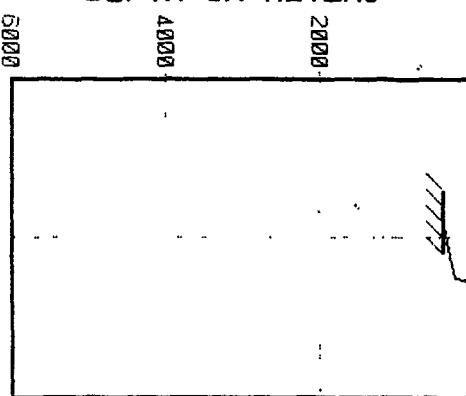
110 + + + + +



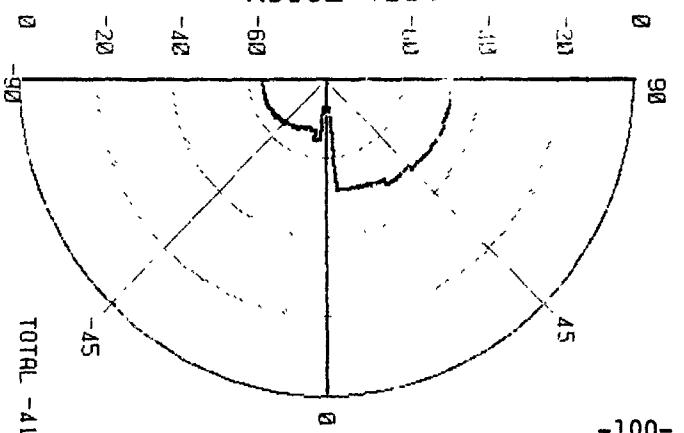
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (dB)



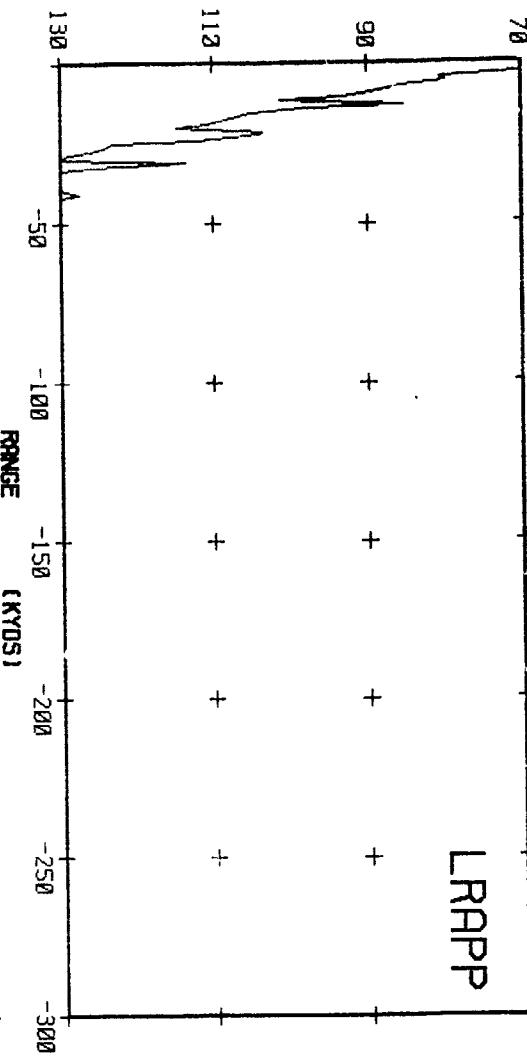
TOTAL -41.9 dB

RER 5 WINTER

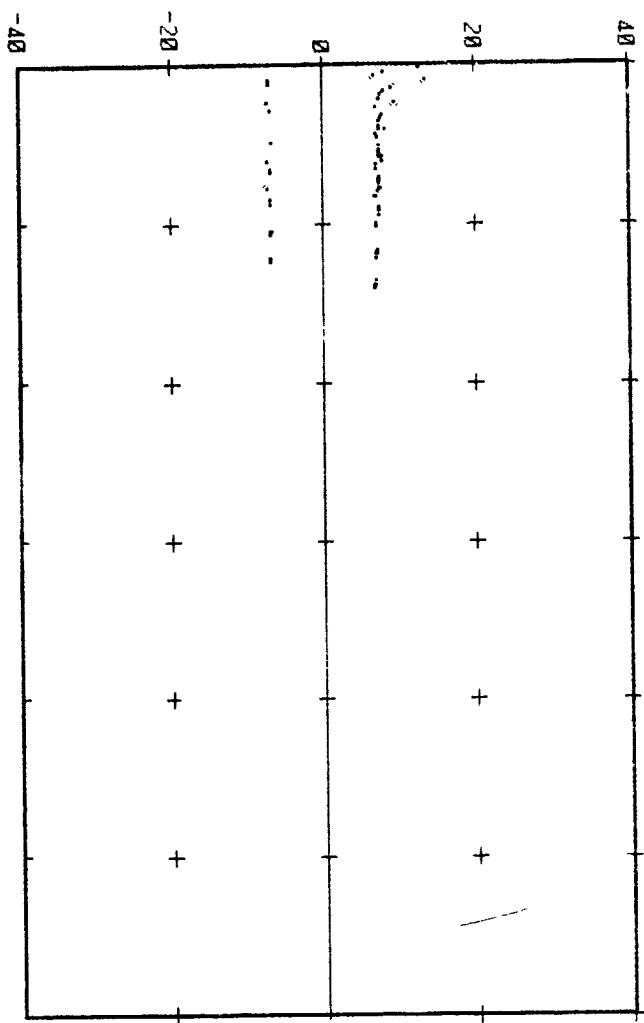
1450 M/S 1500 1550

LRAPP

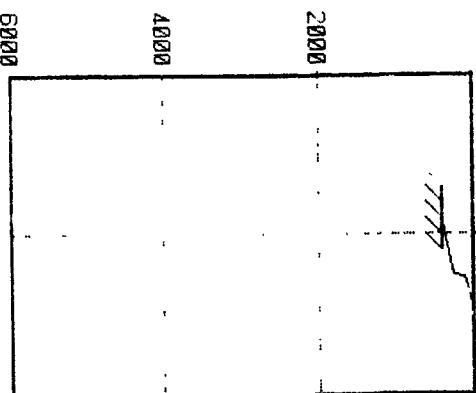
DB LOSS



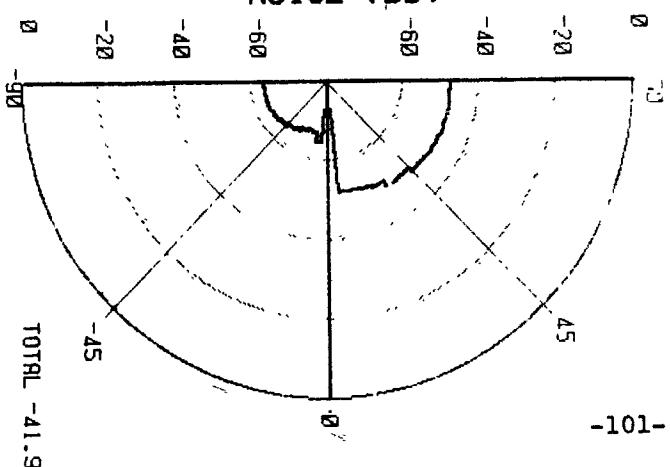
ARRIVAL ANGLE



DEPTH IN METERS

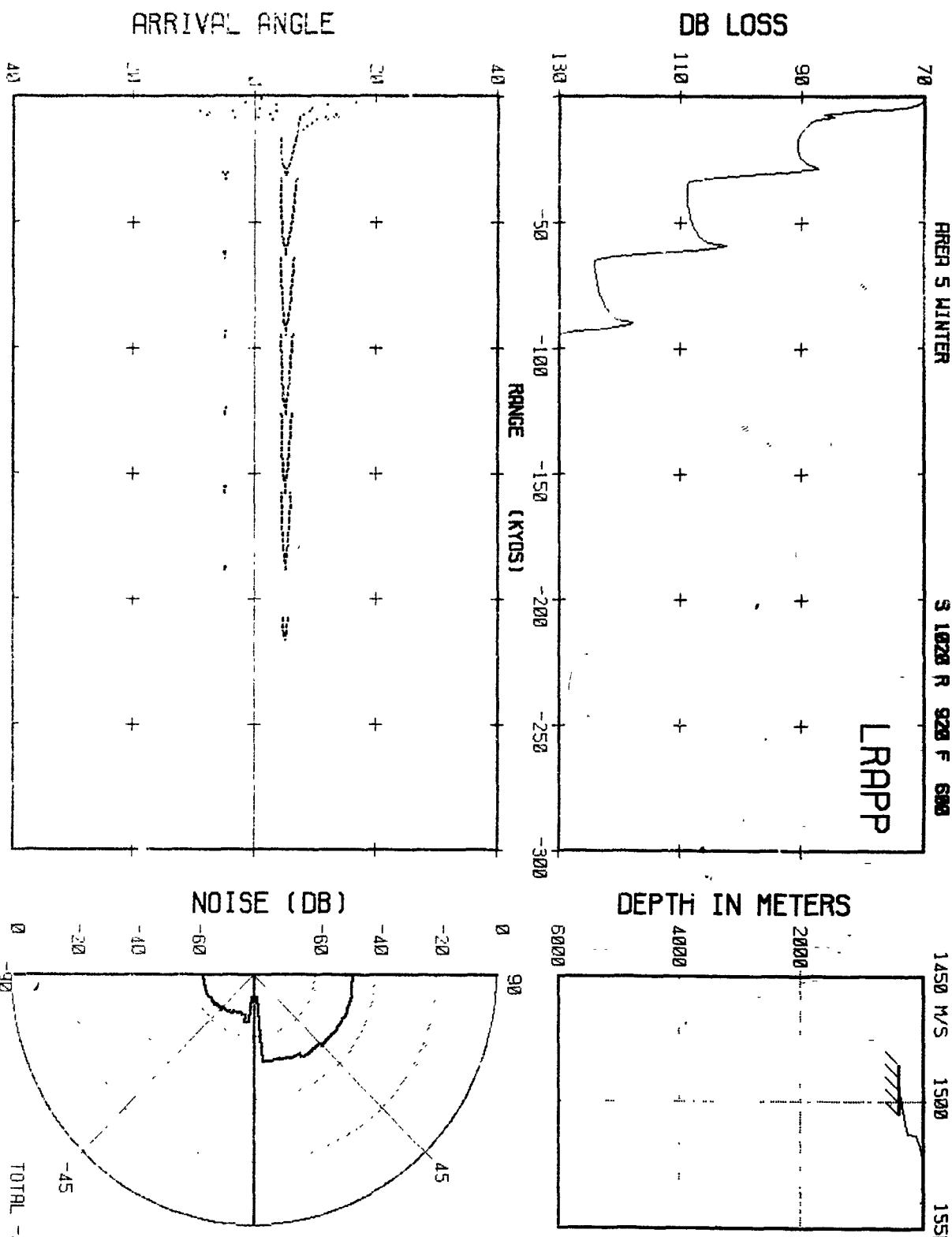


NOISE (DB)



TOTAL -41.9 dB

卷之三



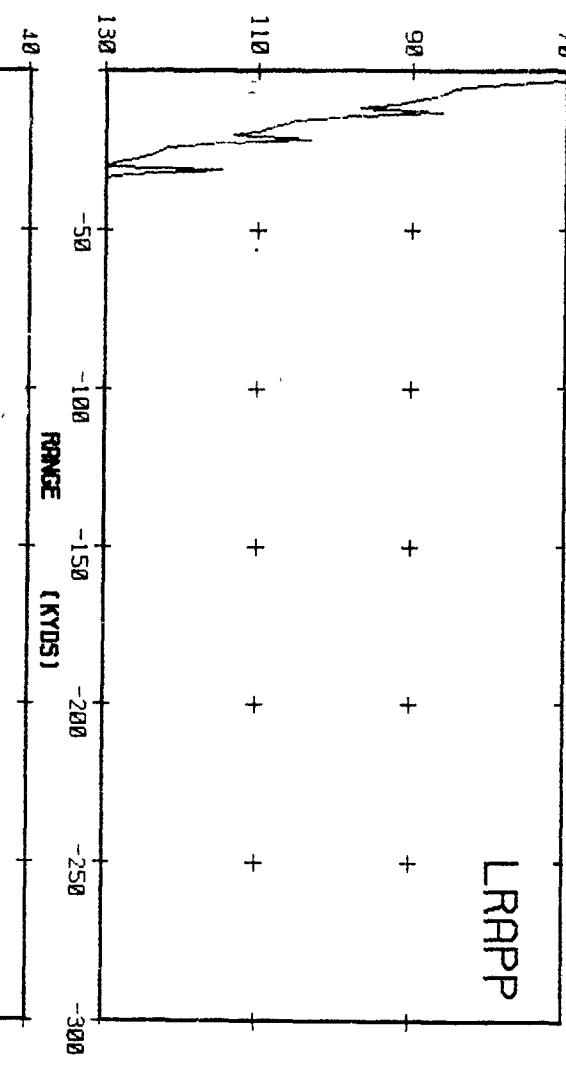
WINTER 5 WINTER

S 20 R 1000 F 600

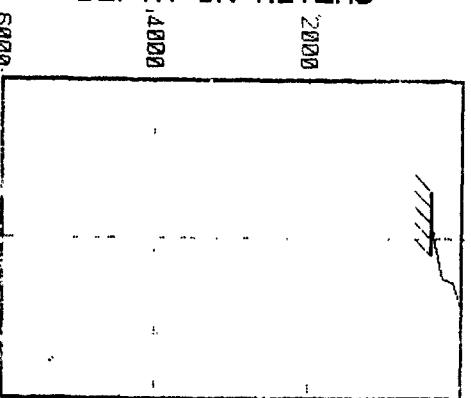
1450 M/S 1500 1550

LRAPP

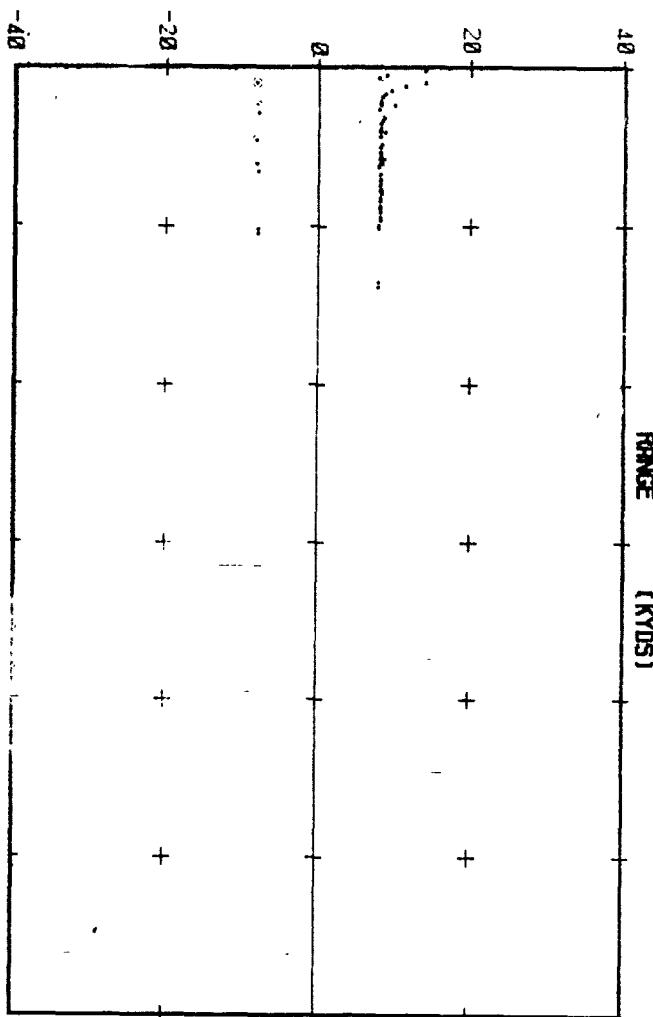
DB LOSS



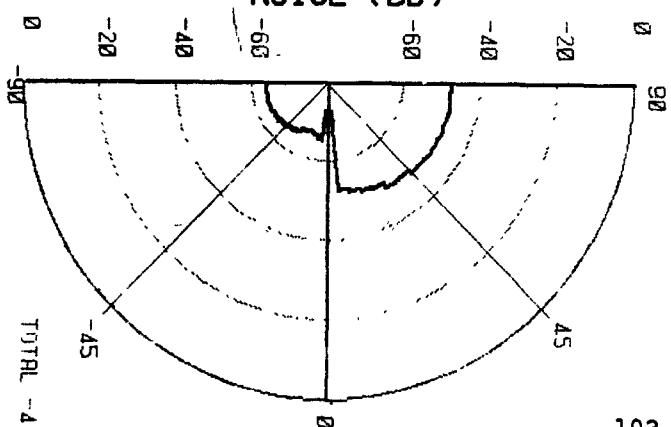
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



TOTAL -41.9 DR

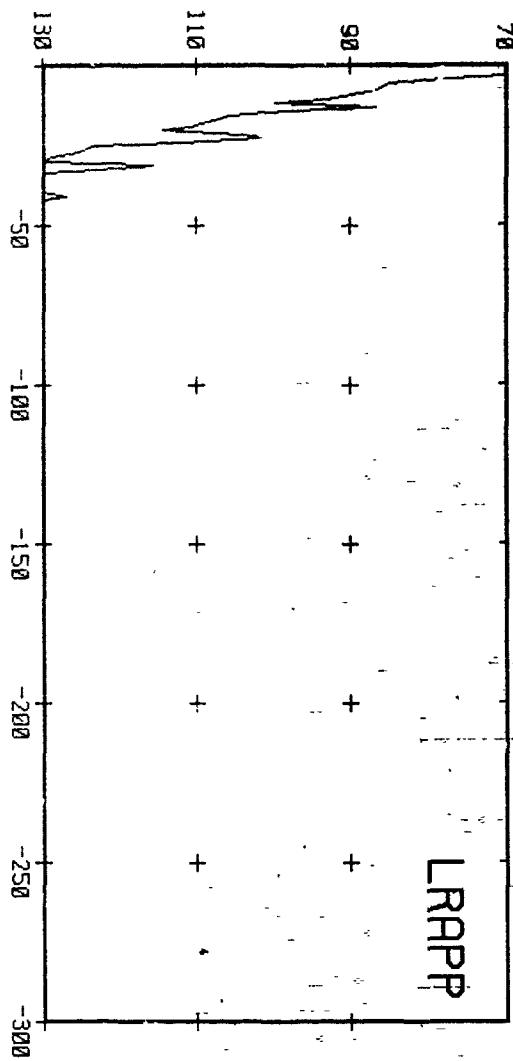
PRED 5 WINTER

S 50 R 1000 F 600

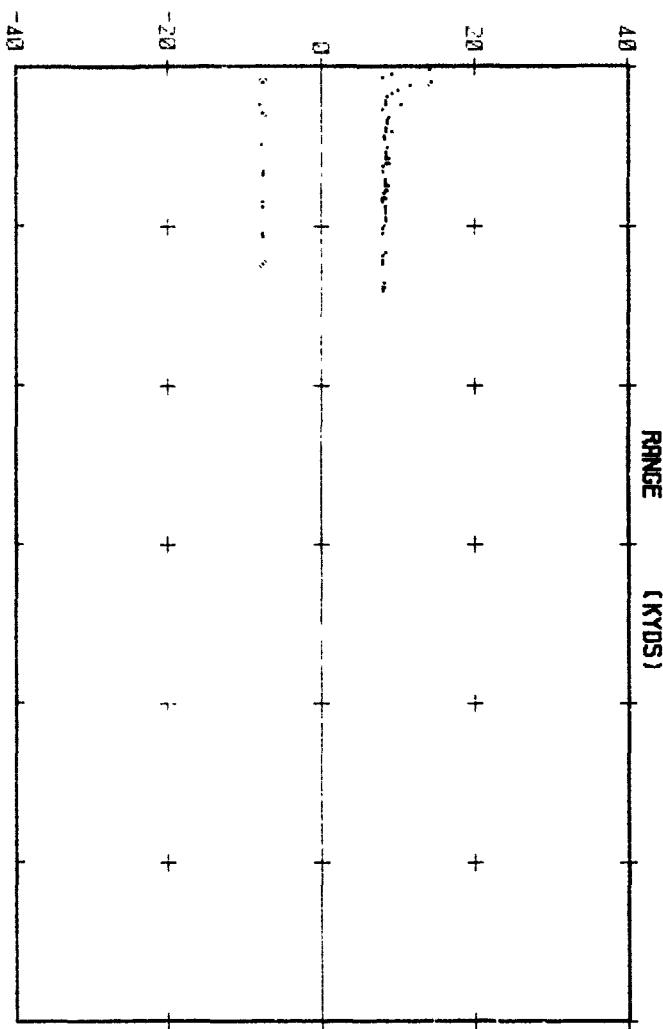
1450 M/S 1500

1550

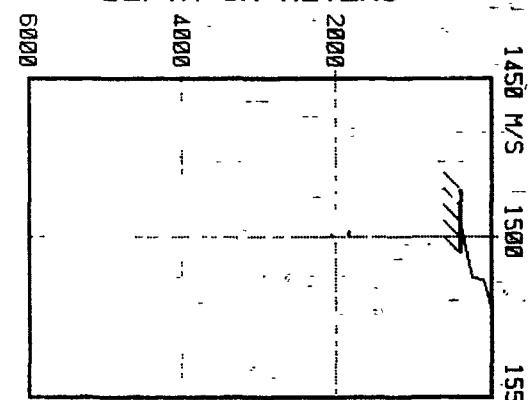
DB LOSS



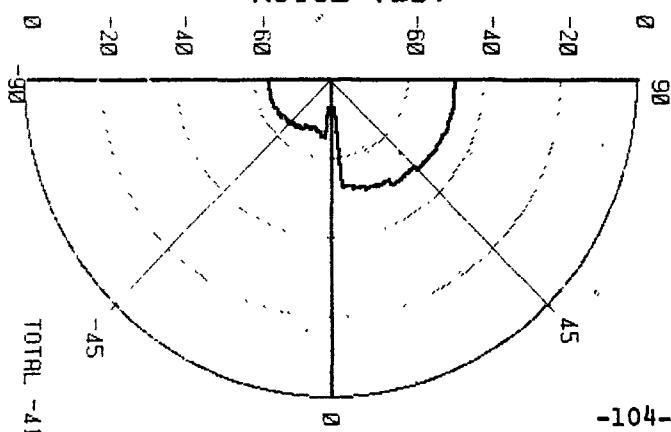
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -41.9 DB

ARR 5 WINTER

S 1020 R 1050 F 600

1450 M/S 1500 1550

LRAPP

DB LOSS

90 + + + + +

2000

110 + + + + +

4000

130 -100 -150 -200 -250 -300

6000

110 -100 -150 -200 -250 -300

4000

90 -100 -150 -200 -250 -300

2000

ARRIVAL ANGLE

-20 + + + + +

0

0 + + + + +

45

20 + + + + +

90

DEPTH IN METERS

4000

2000

0

NOISE (DB)

0

30

60

90

120

150

180

210

240

270

300

330

360

390

420

450

480

510

540

570

600

630

660

690

720

750

780

810

840

870

900

930

960

990

1020

1050

1080

1110

1140

1170

1200

1230

1260

1290

1320

1350

1380

1410

1440

1470

1500

1530

1560

1590

1620

1650

1680

1710

1740

1770

1800

1830

1860

1890

1920

1950

1980

2010

2040

2070

2100

2130

2160

2190

2220

2250

2280

2310

2340

2370

2400

2430

2460

2490

2520

2550

2580

2610

2640

2670

2700

2730

2760

2790

2820

2850

2880

2910

2940

2970

3000

3030

3060

3090

3120

3150

3180

3210

3240

3270

3300

3330

3360

3390

3420

3450

3480

3510

3540

3570

3600

3630

3660

3690

3720

3750

3780

3810

3840

3870

3900

3930

3960

3990

4020

4050

4080

4110

4140

4170

4200

4230

4260

4290

4320

4350

4380

4410

4440

4470

4500

4530

4560

4590

4620

4650

4680

4710

4740

4770

4800

4830

4860

4890

4920

4950

4980

5010

5040

5070

5100

5130

5160

5190

5220

5250

5280

5310

5340

5370

5400

5430

5460

5490

5520

5550

5580

5610

5640

5670

5700

5730

5760

5790

5820

5850

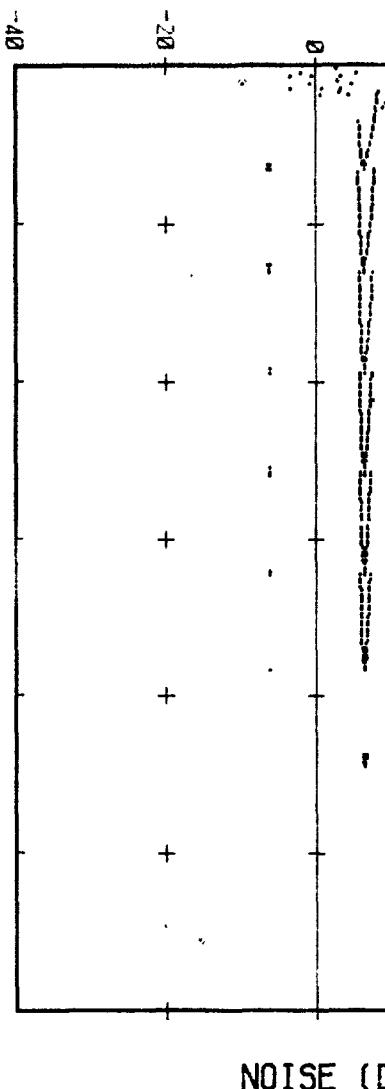
5880

5910

5940

5970

6000



70

RIVER 5 WINTER

S. 20 R 1312 F. 600

1450 M/S

1500

1550

LRAPP

DB LOSS

90

+

+

+

+

+

130
110
40
-50 -100 -150 -200 -250 -300

RANGE (KILOS)

DEPTH IN METERS

2000

4000

6000

0

ARRIVAL ANGLE

-40

-20

0

20

40

60

80

100

120

140

160

180

200

220

240

260

280

300

320

340

360

380

400

420

440

460

480

500

520

540

560

580

600

620

640

660

680

700

720

740

760

780

800

820

840

860

880

900

920

940

960

980

1000

1020

1040

1060

1080

1100

1120

1140

1160

1180

1200

1220

1240

1260

1280

1300

1320

1340

1360

1380

1400

1420

1440

1460

1480

1500

1520

1540

1560

1580

1600

1620

1640

1660

1680

1700

1720

1740

1760

1780

1800

1820

1840

1860

1880

1900

1920

1940

1960

1980

2000

2020

2040

2060

2080

2100

2120

2140

2160

2180

2200

2220

2240

2260

2280

2300

2320

2340

2360

2380

2400

2420

2440

2460

2480

2500

2520

2540

2560

2580

2600

2620

2640

2660

2680

2700

2720

2740

2760

2780

2800

2820

2840

2860

2880

2900

2920

2940

2960

2980

3000

3020

3040

3060

3080

3100

3120

3140

3160

3180

3200

3220

3240

3260

3280

3300

3320

3340

3360

3380

3400

3420

3440

3460

3480

3500

3520

3540

3560

3580

3600

3620

3640

3660

3680

3700

3720

3740

3760

3780

3800

3820

3840

3860

3880

3900

3920

3940

3960

3980

4000

4020

4040

4060

4080

4100

4120

4140

4160

4180

4200

4220

4240

4260

4280

4300

4320

4340

4360

4380

4400

4420

4440

4460

4480

4500

4520

4540

4560

4580

4600

4620

4640

4660

4680

4700

4720

4740

4760

4780

4800

4820

4840

4860

4880

4900

4920

4940

4960

4980

5000

5020

5040

5060

5080

5100

5120

5140

5160

5180

5200

5220

5240

5260

5280

5300

5320

5340

5360

5380

5400

5420

5440

5460

5480

5500

5520

5540

5560

5580

5600

5620

5640

5660

5680

5700

5720

5740

5760

5780

5800

5820

5840

1458 M/S 1504 1559

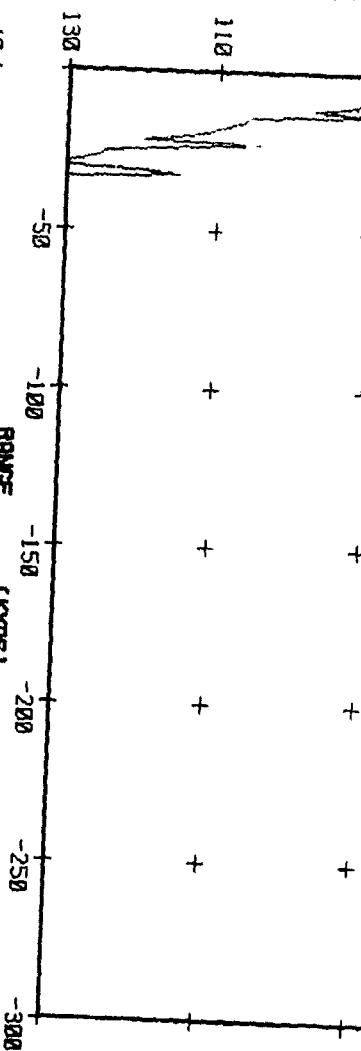
78

PAPER 5 WINTER

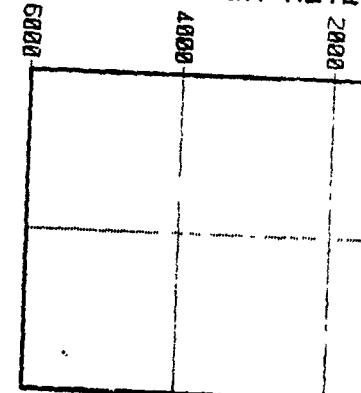
S 32 R 1312 F 683

LRAPP

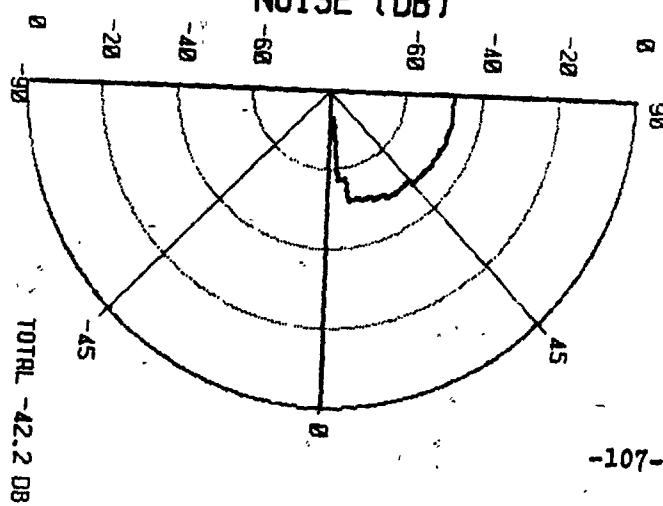
DB LOSS



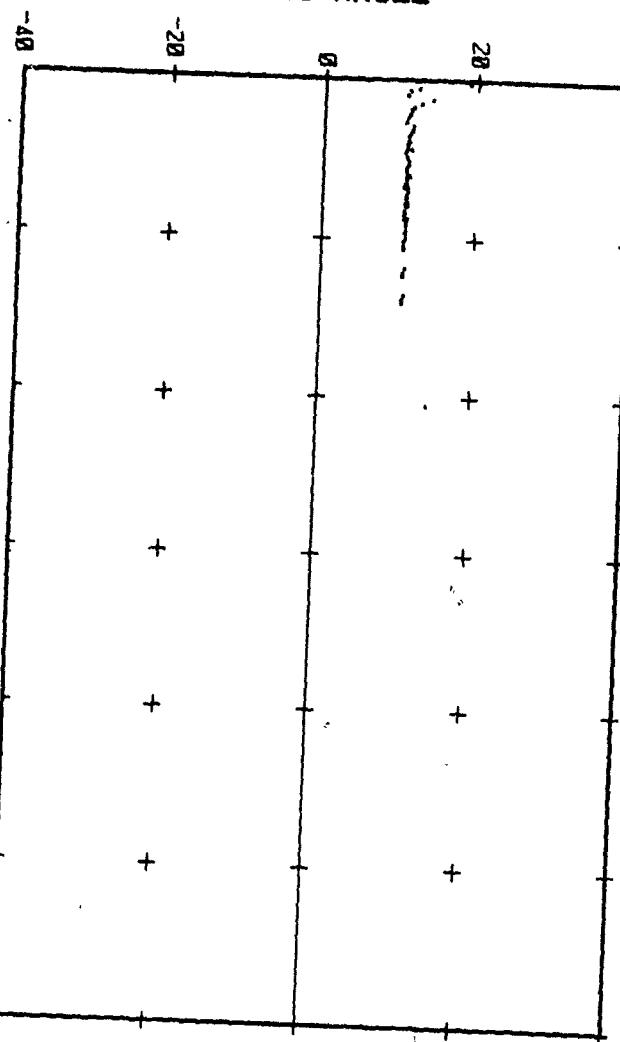
DEPTH IN METERS

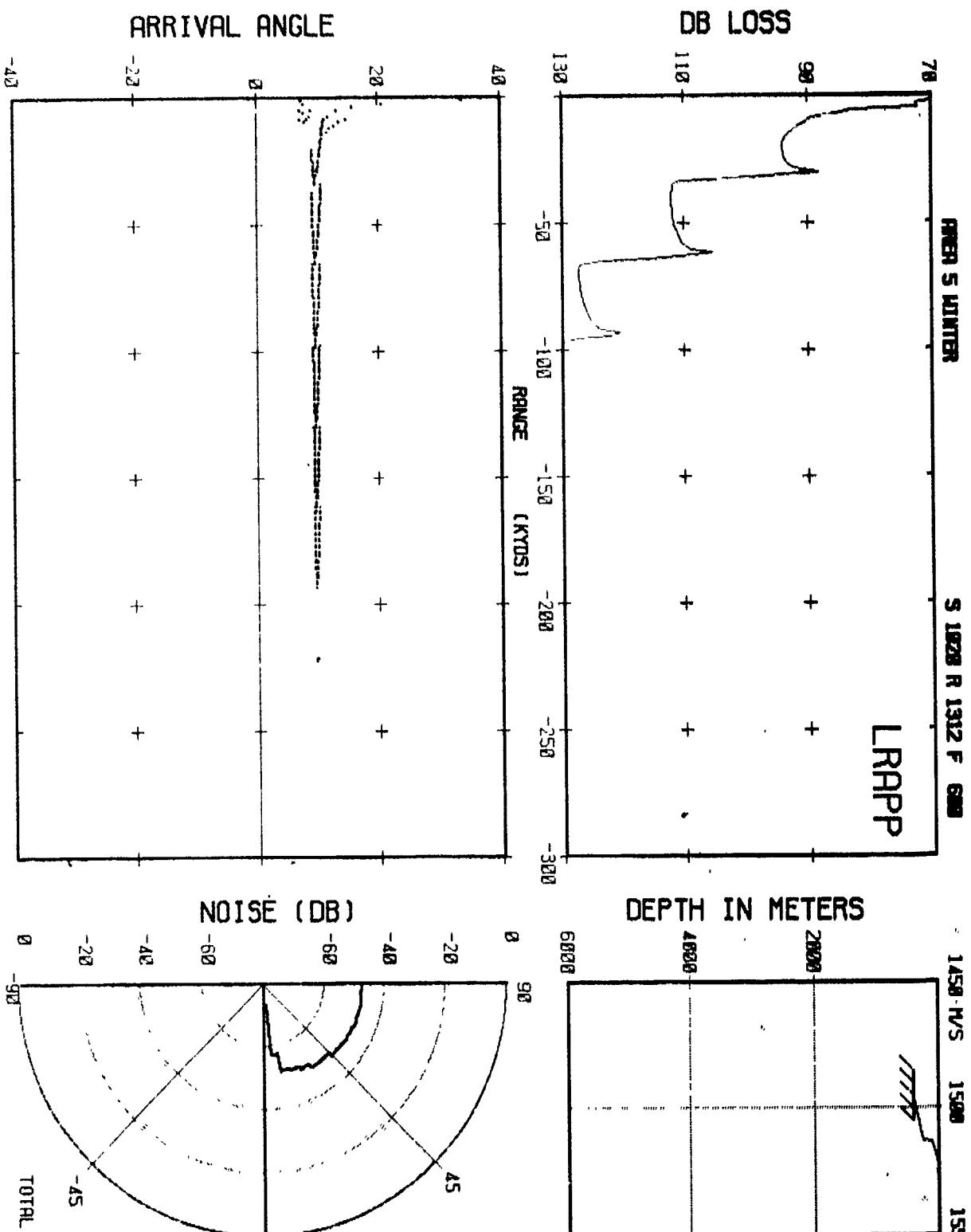


NOISE (DB)



ARRIVAL ANGLE





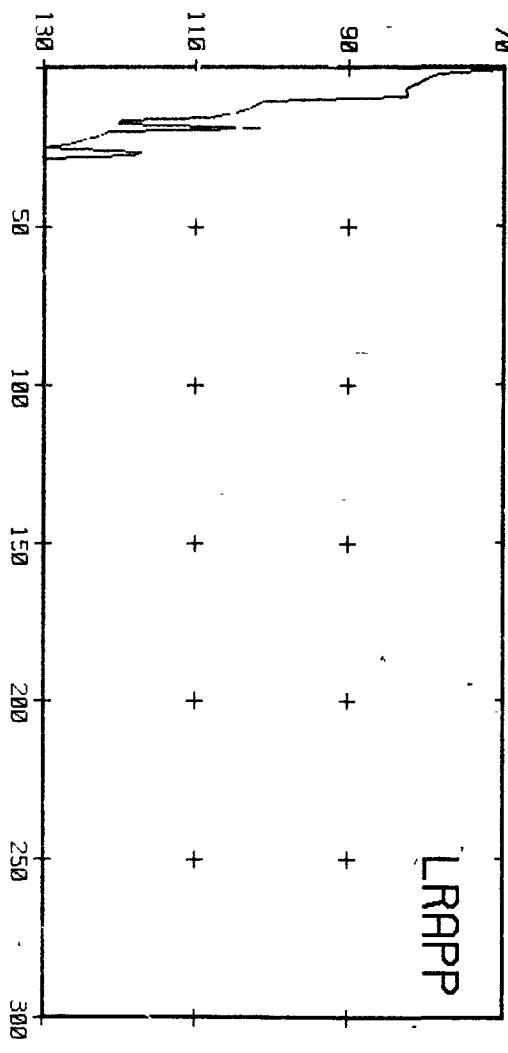
ARR 5 WINTER

S 20 R 60 F 900

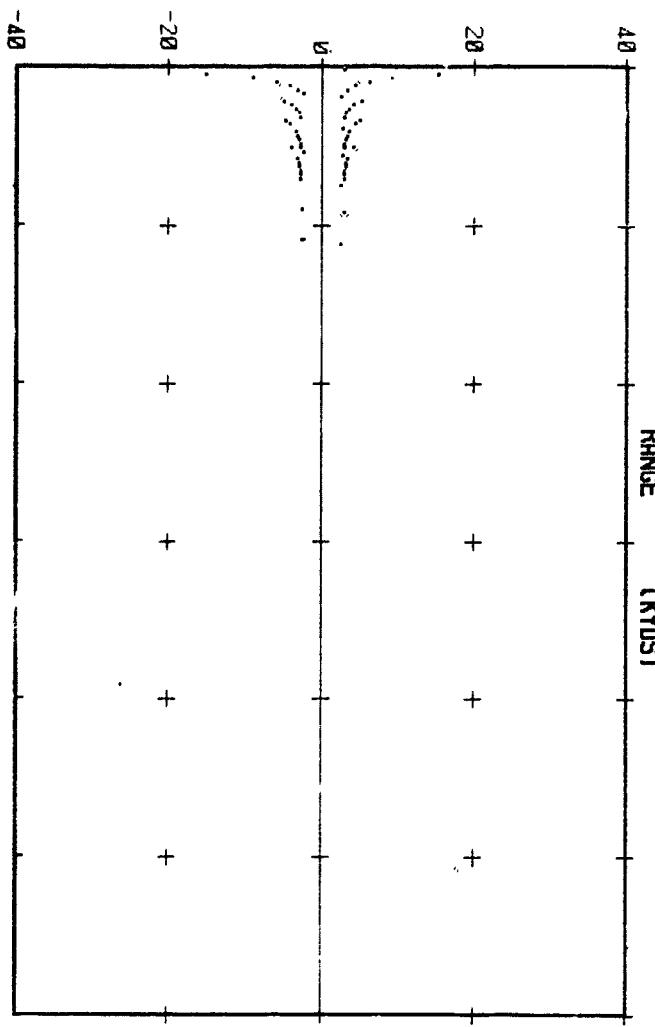
1450 M/S 1500 1550

LRAAPP

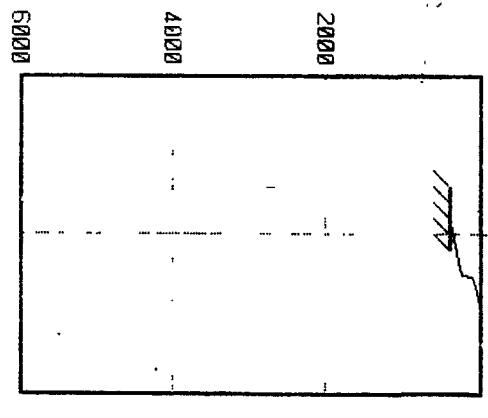
DB LOSS



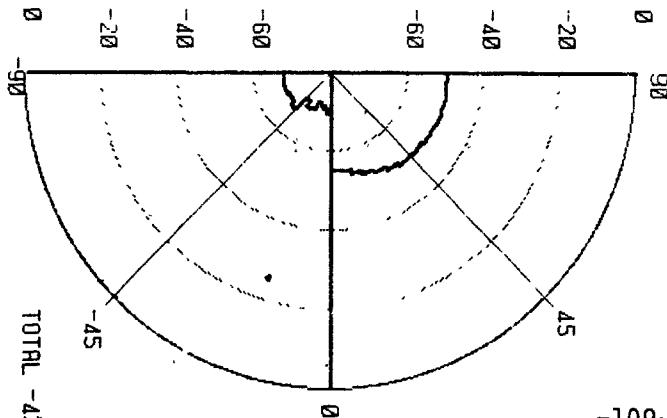
ARRIVAL ANGLE



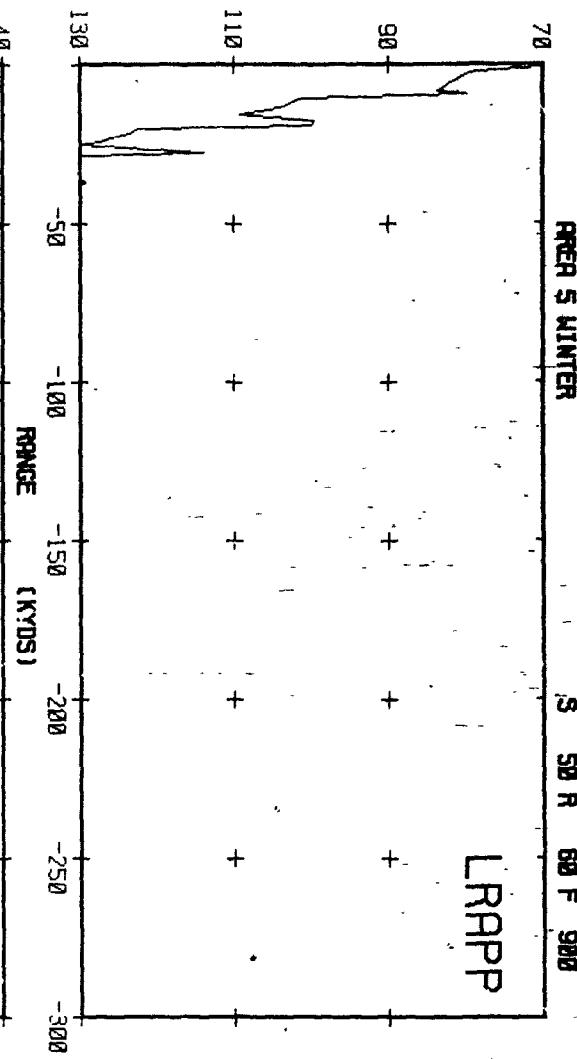
DEPTH IN METERS



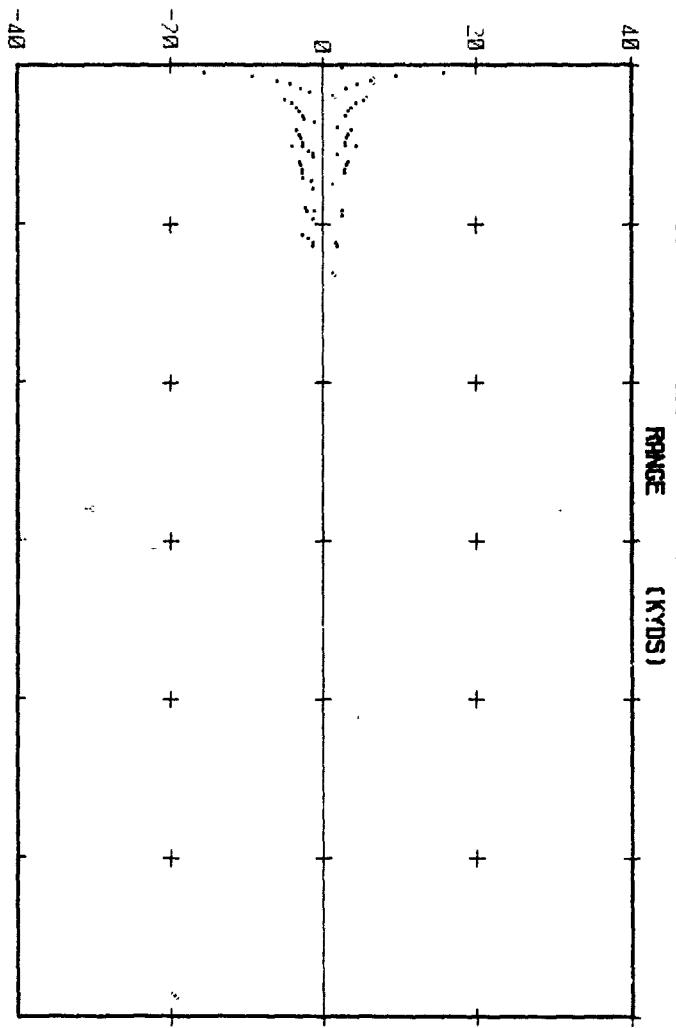
NOISE (DB)



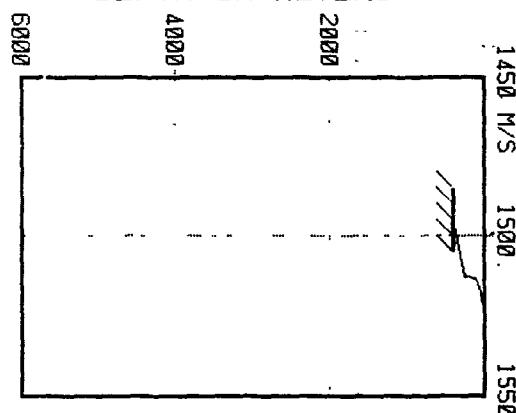
DB LOSS



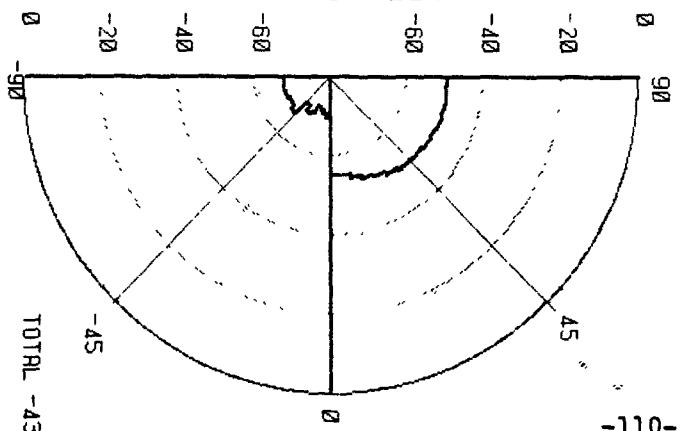
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -43.7 DB

70

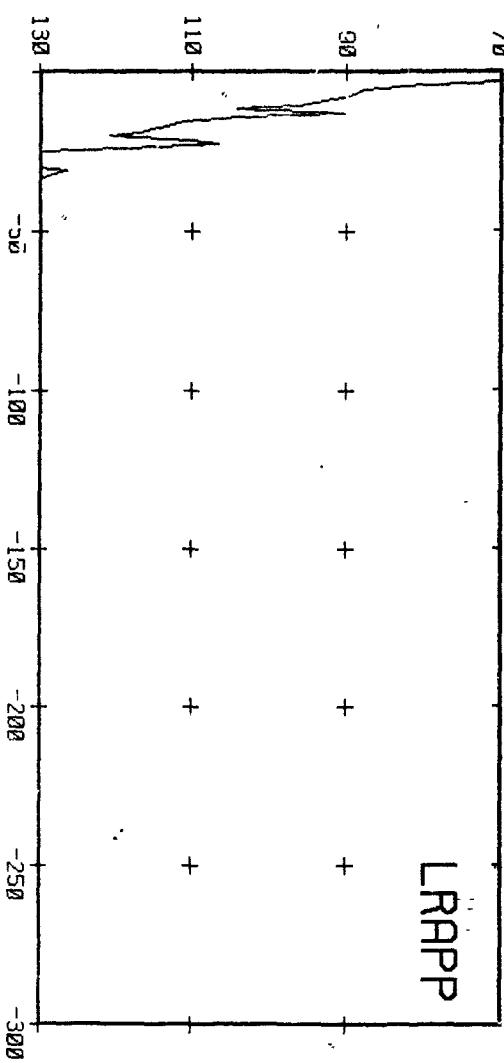
AREA 5 WINTER

S1020 R 62 F 900

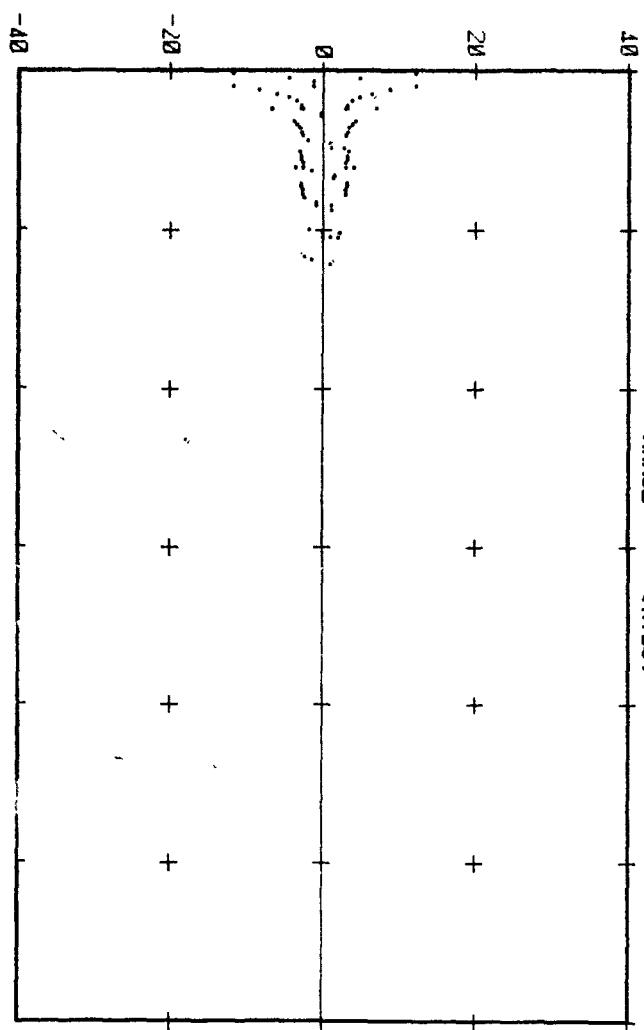
1450 M/S 1500 1550

LRAPP

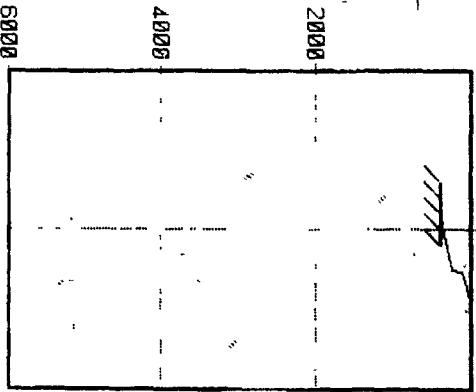
DB LOSS



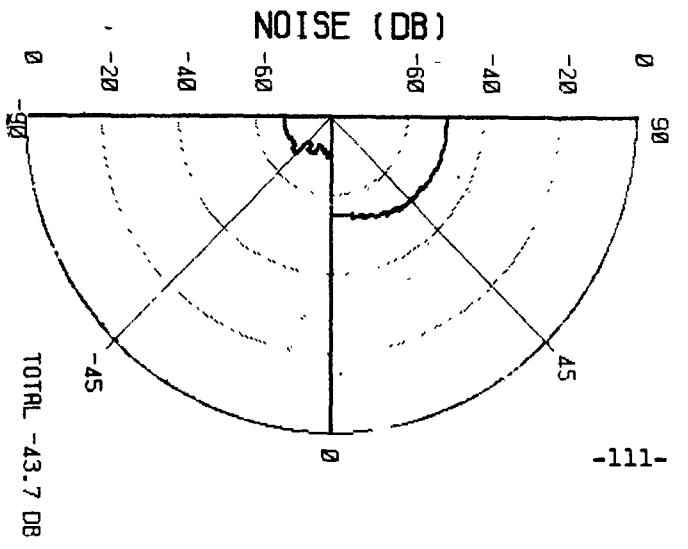
ARRIVAL ANGLE



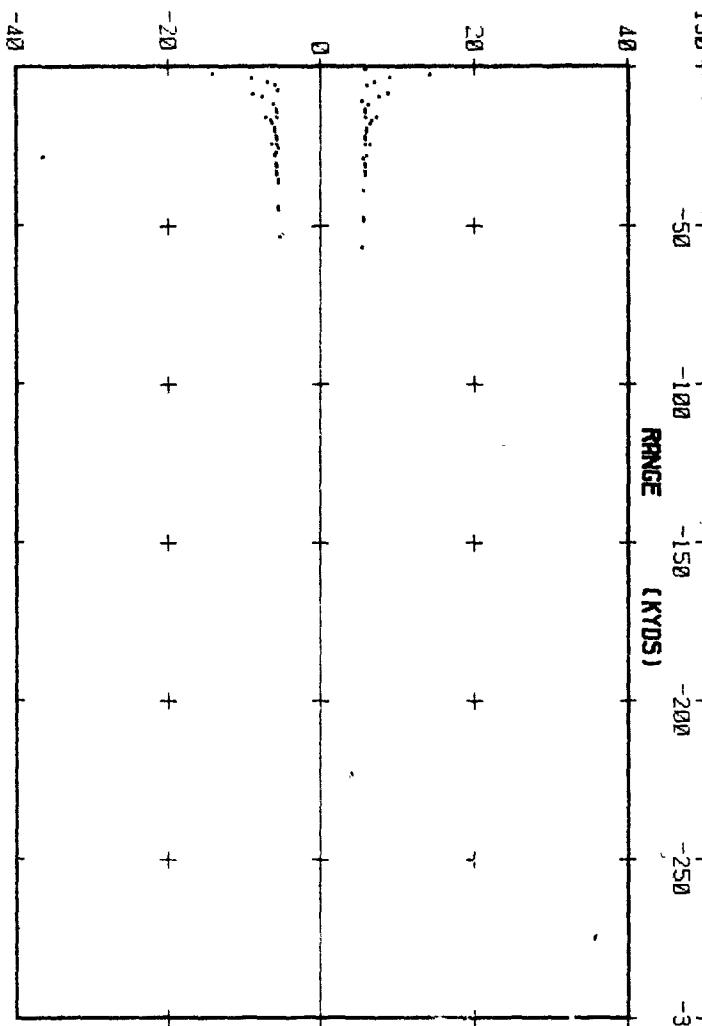
DEPTH IN METERS



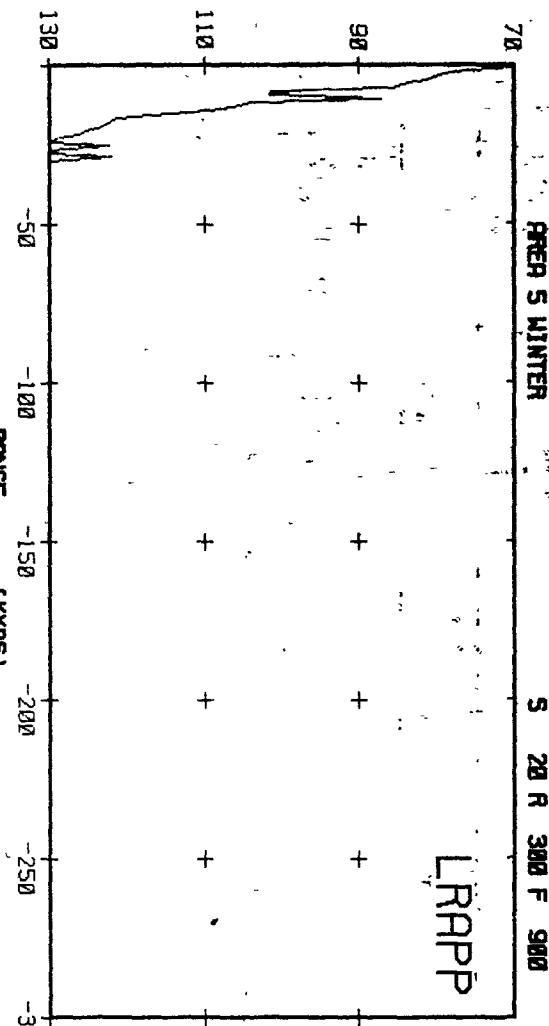
NOISE (DB)



ARRIVAL ANGLE

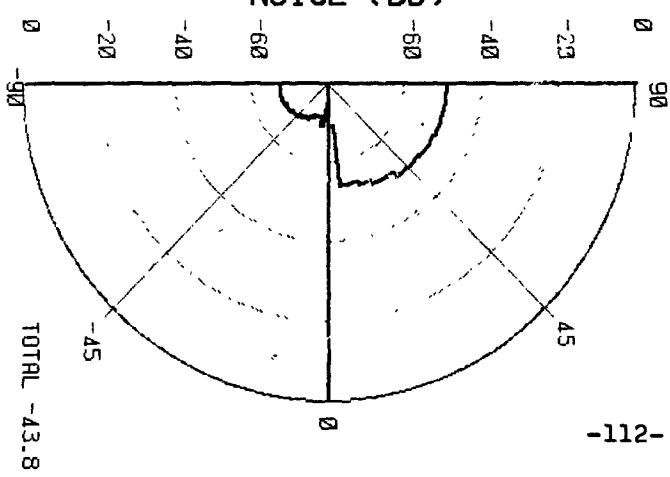


DB LOSS

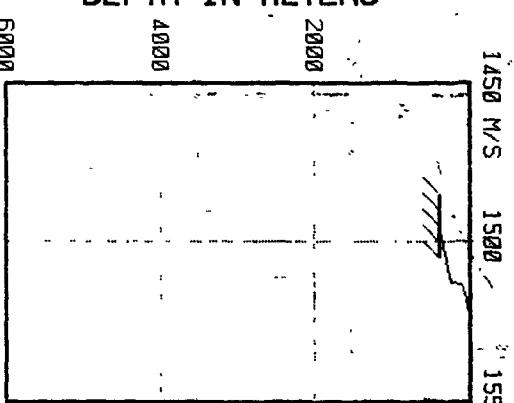


L RAPP

NOISE (DB)



DEPTH IN METERS



70

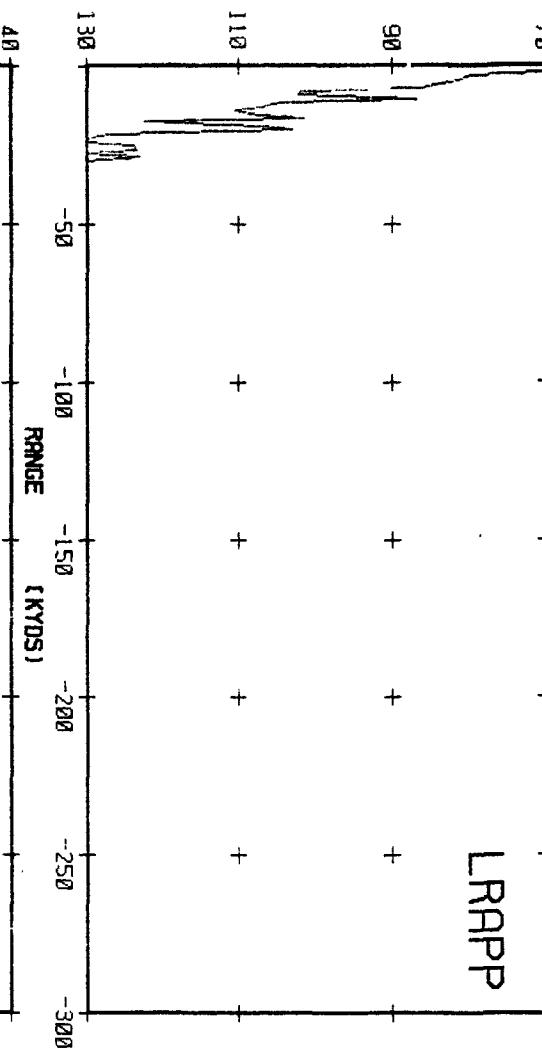
AREA 5 WINTER

S 50 R 300 F 900

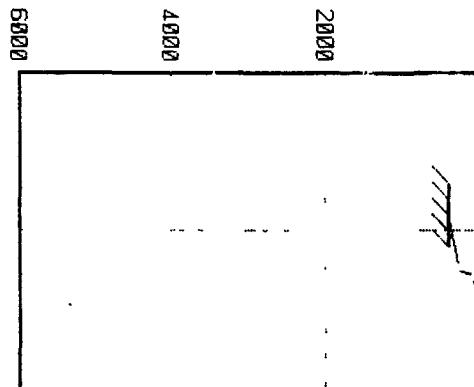
1450 M/S 1500 1550

LRAPP

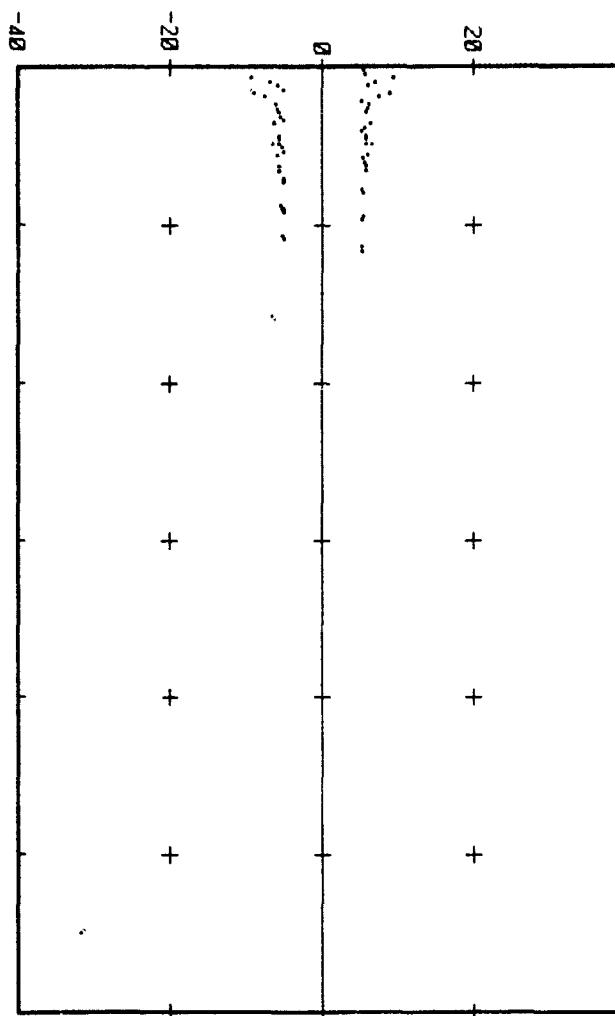
DB LOSS



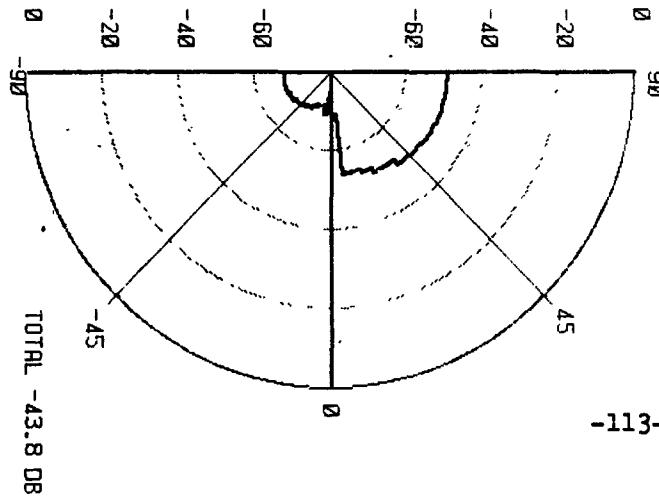
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



17.0 17.0 17.0 17.0

17.0 17.0 17.0 17.0

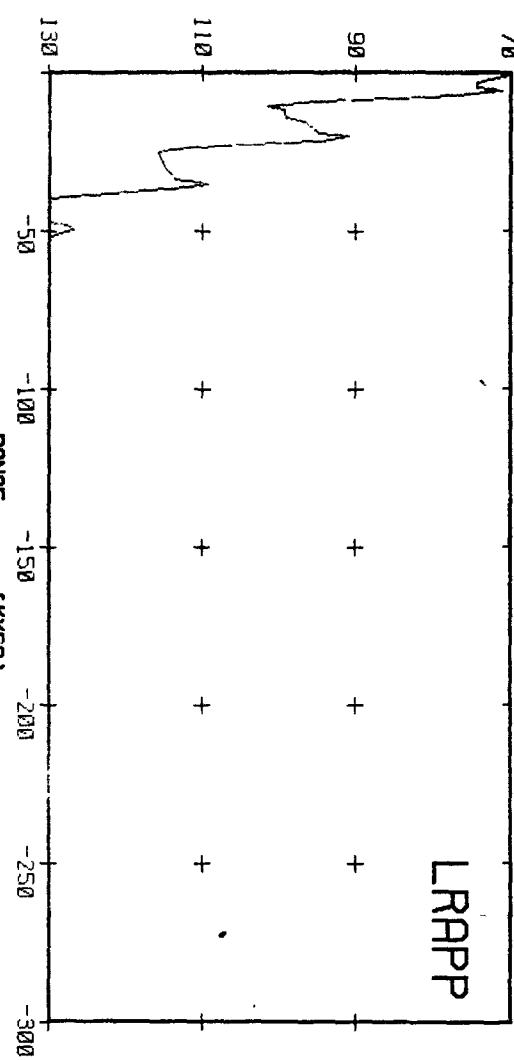
AREA 5 WINTER

S 1020 R 300 F 900

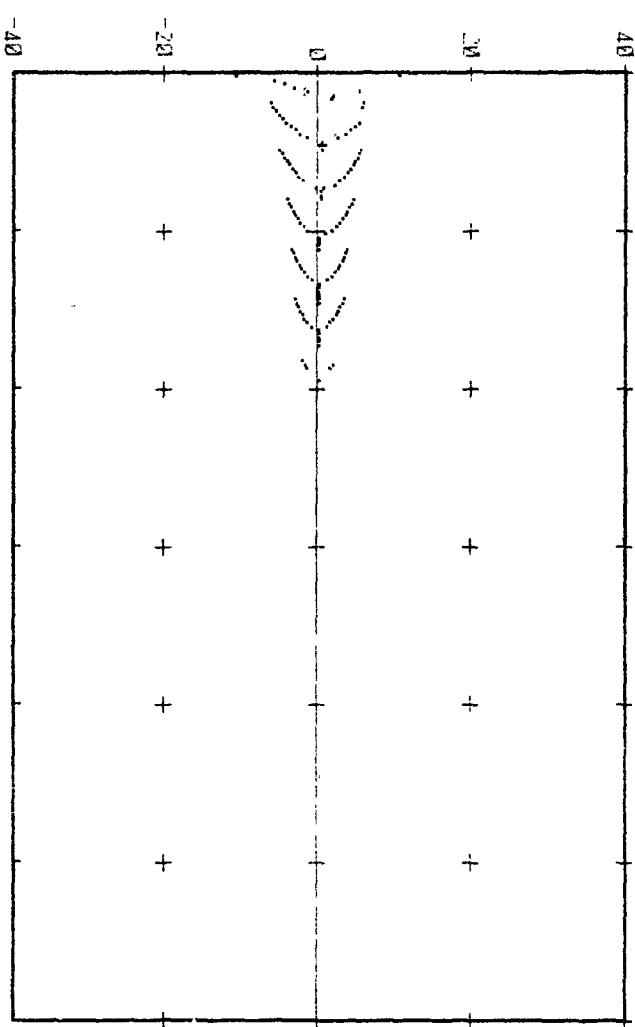
1450 M/S 1500 1550

LRAPP

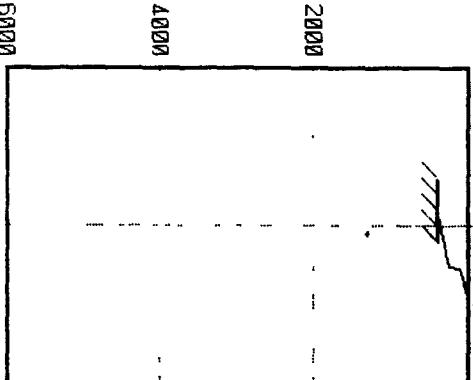
DB LOSS



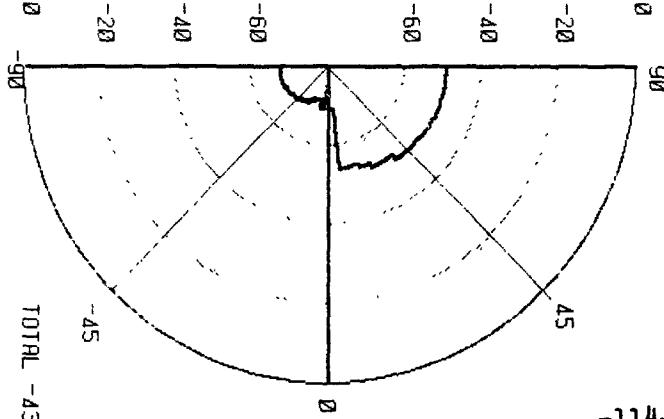
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



78

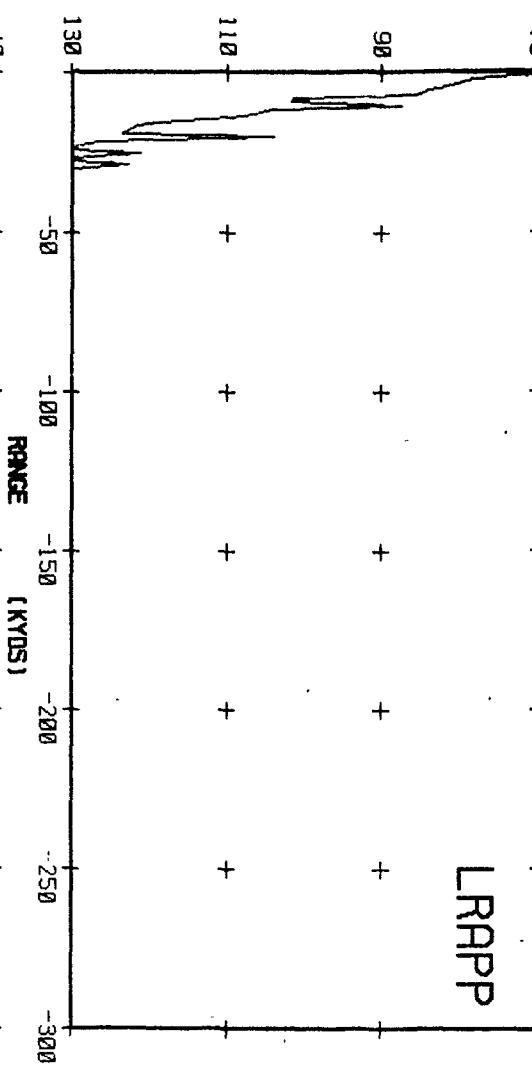
AREA 5 WINTER

S 20 R 328 F 900

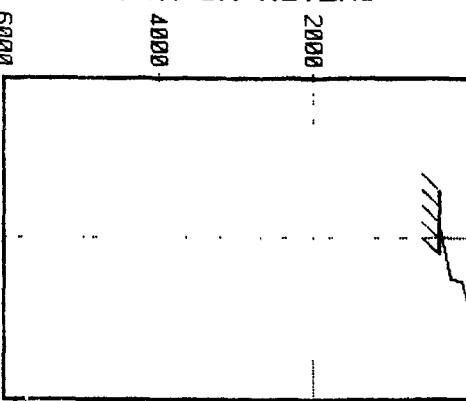
1450 M/S 1500 1550

LRAPP

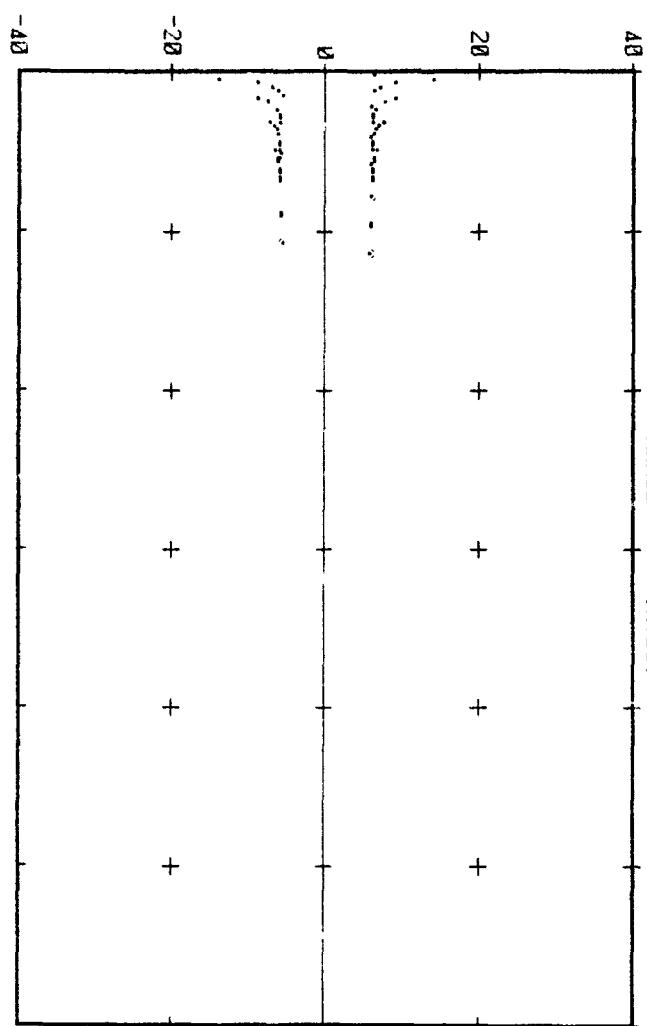
DB LOSS



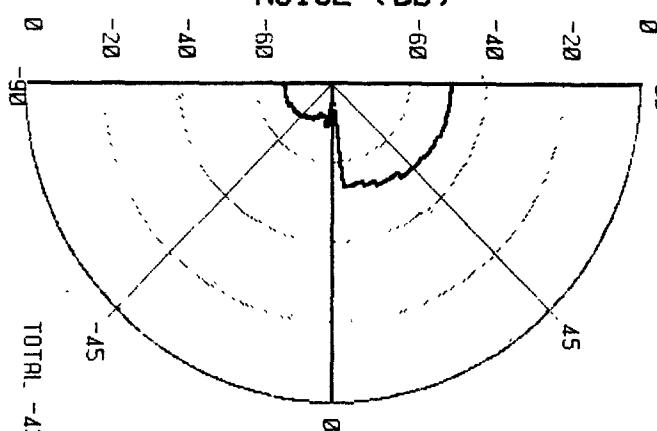
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



TOTAL -43.8 DB

ARRER 5 WINTER

S 50 R 328 F 900

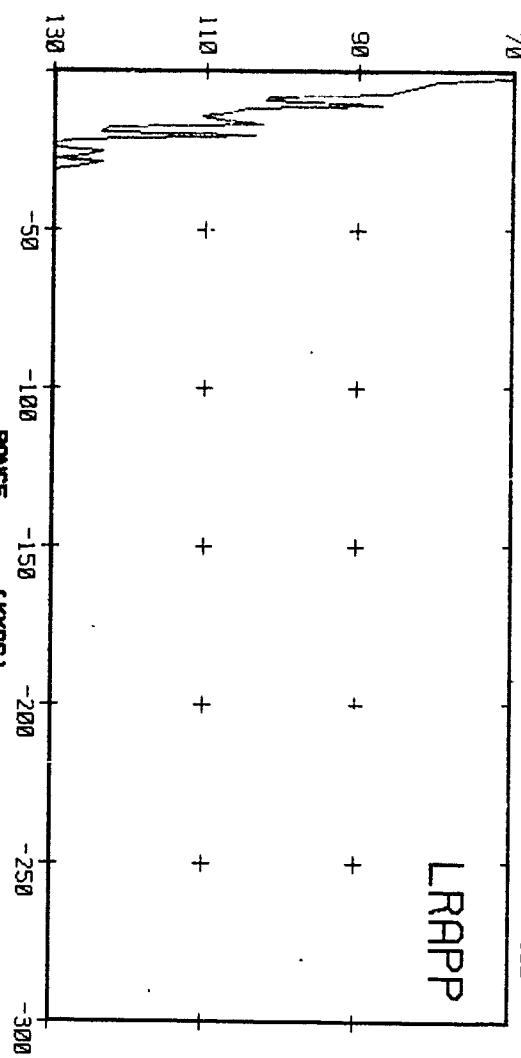
1450 M/S

1500

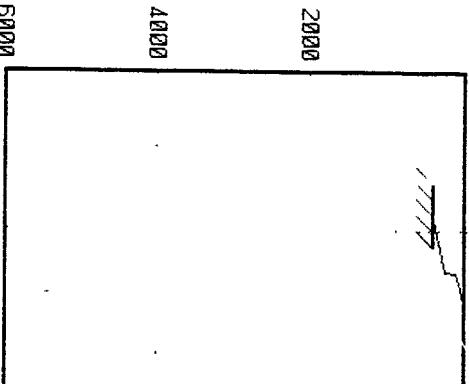
1550

LRAAPP

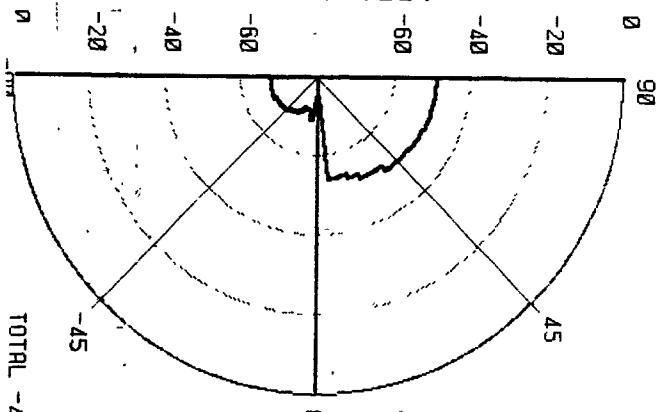
DB LOSS



DEPTH IN METERS



NOISE (DB)



TOTAL -43.8 dB

78

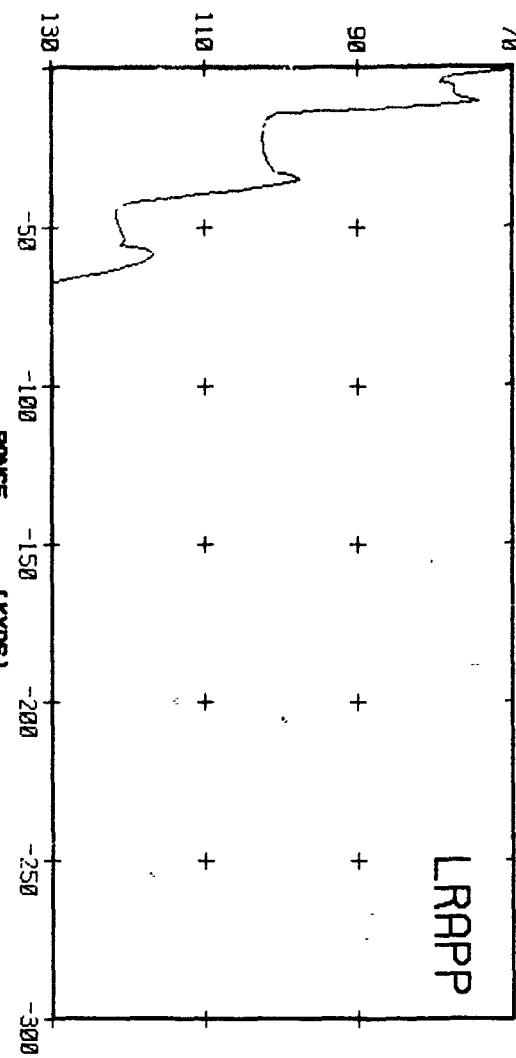
AREA 5 WINTER

S 1020 R 328 F 900

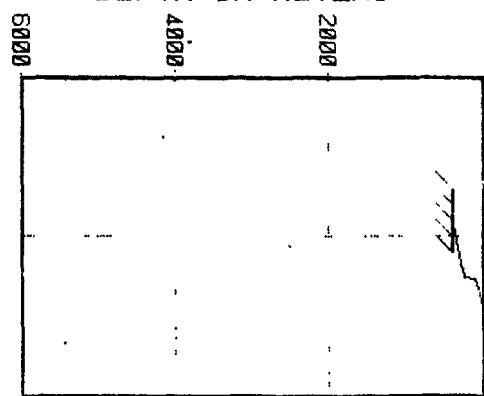
1450 M/S 1500 1550

LRAPP

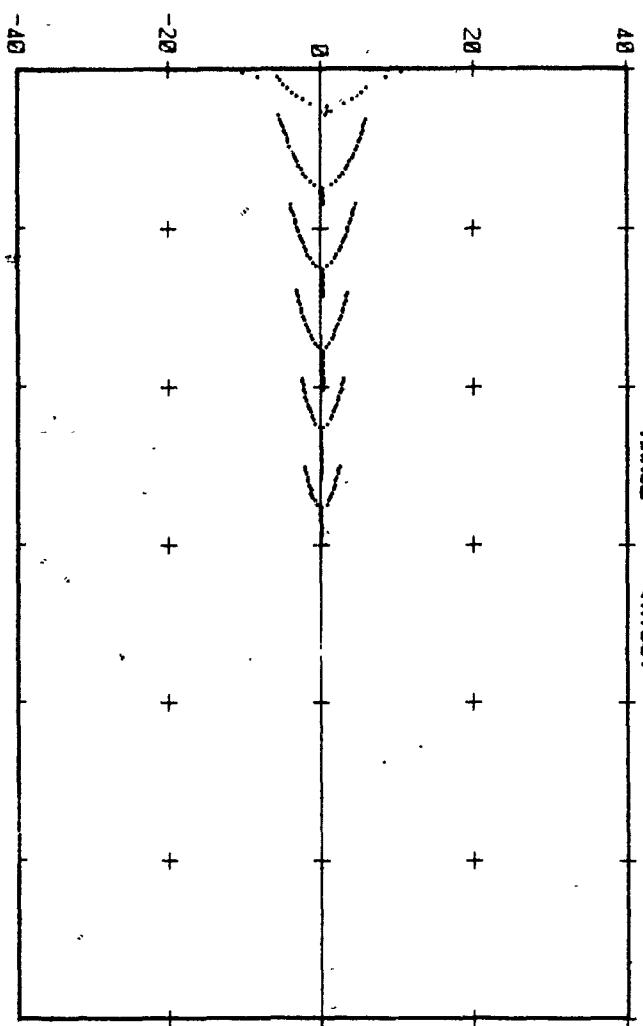
DB LOSS



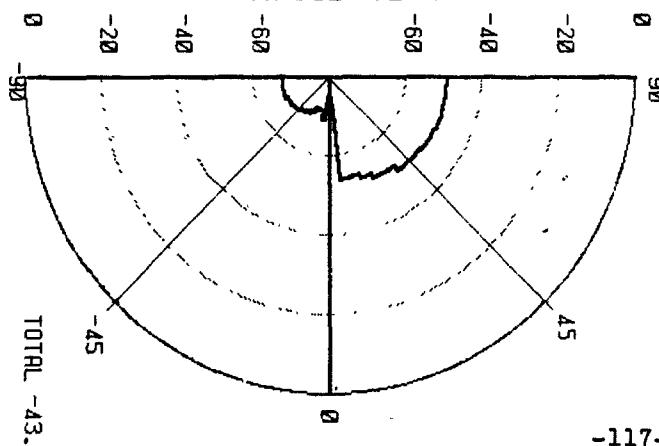
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



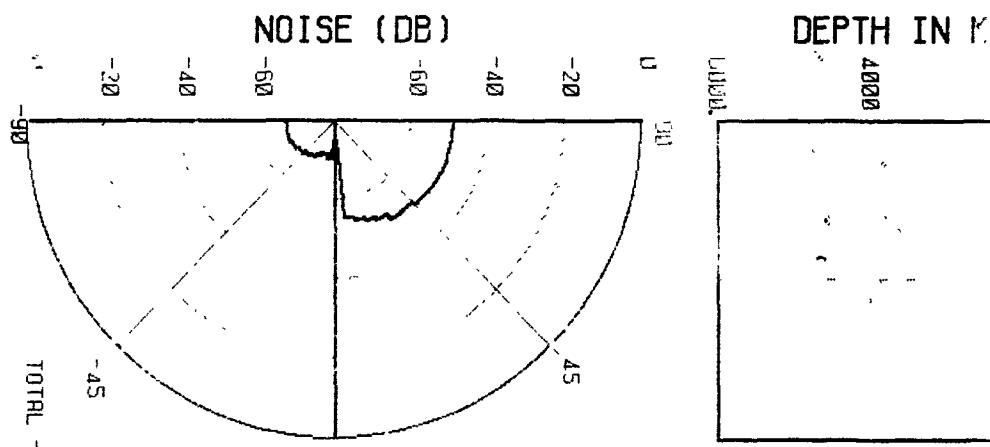
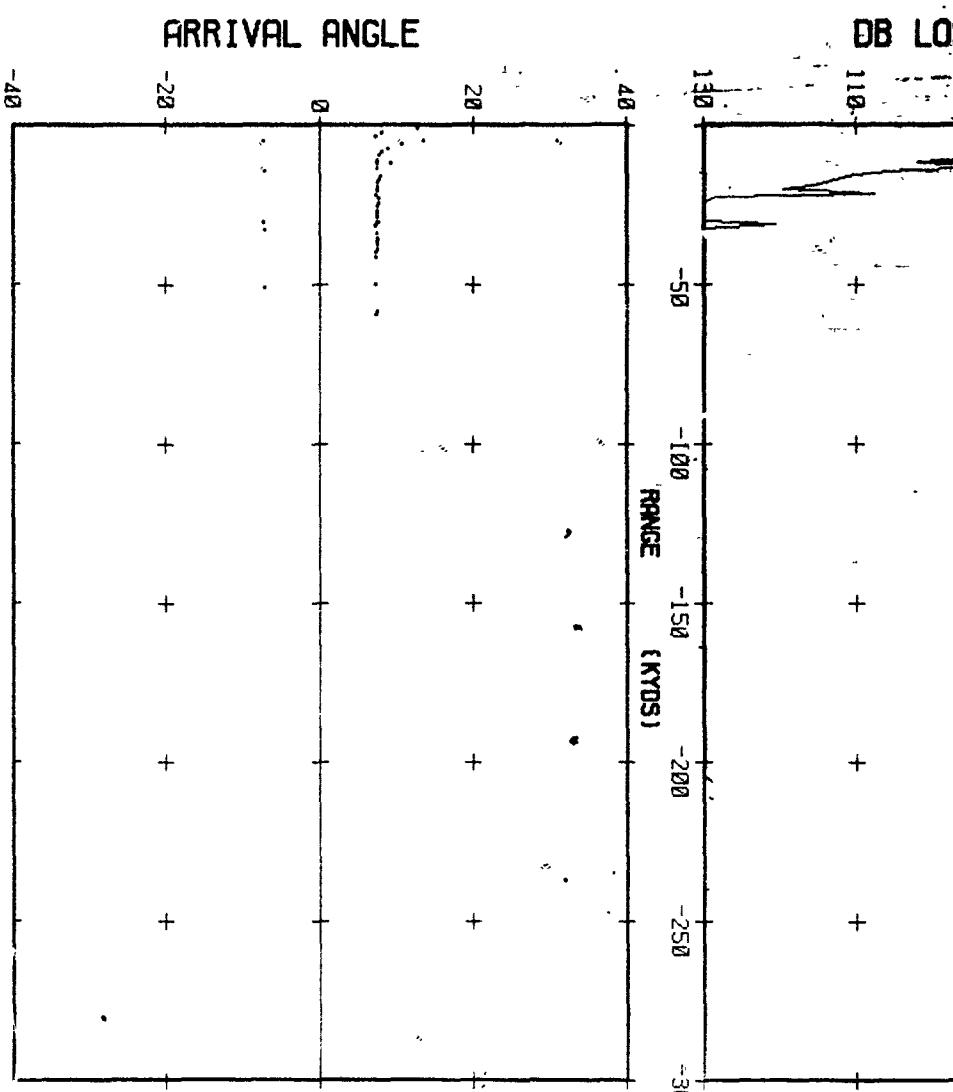
TOTAL -43.8 DB

1

FRESH 5 WINTER

S 28 R 926 F

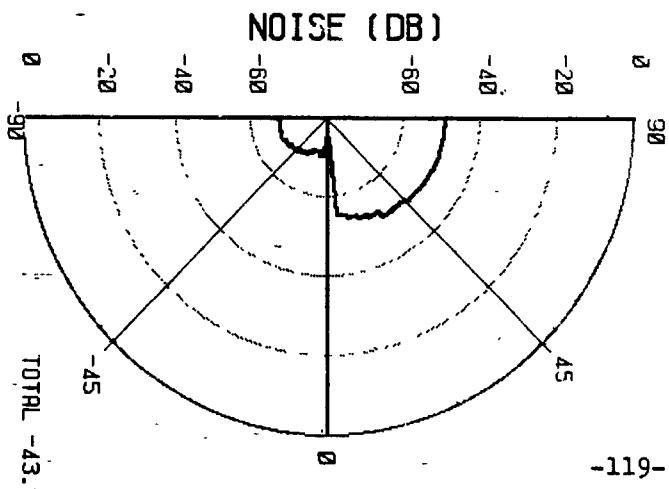
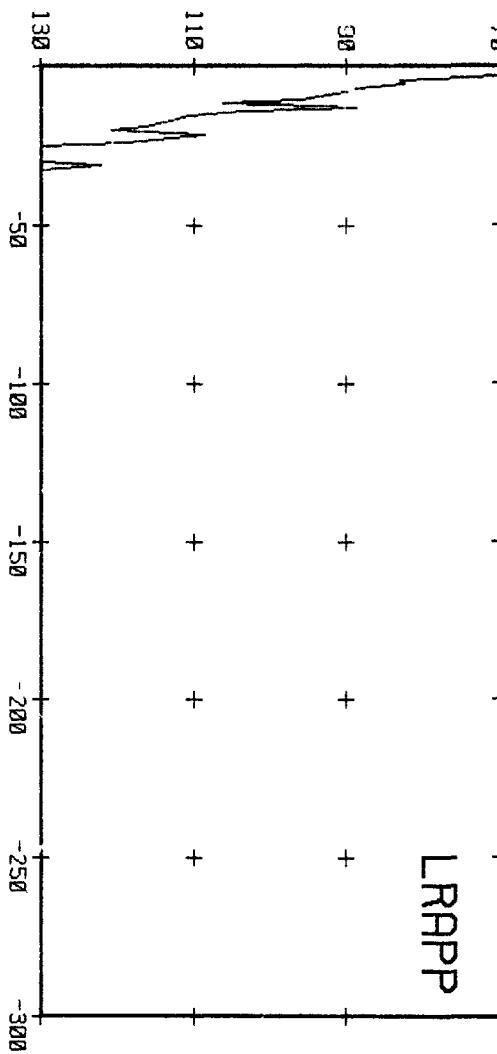
1554 SAV M/S 1500



FIFTH WINTER

S 58 R 928 F 983

1450 M/S 1500 1550



70

ARR 5 WINTER

S 1020 R 920 F 900

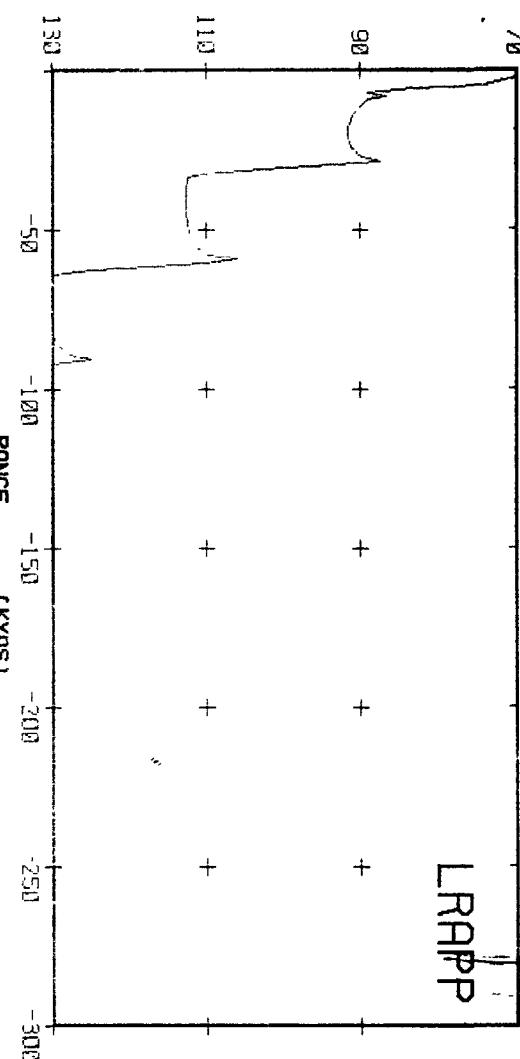
1450 M/S

1500

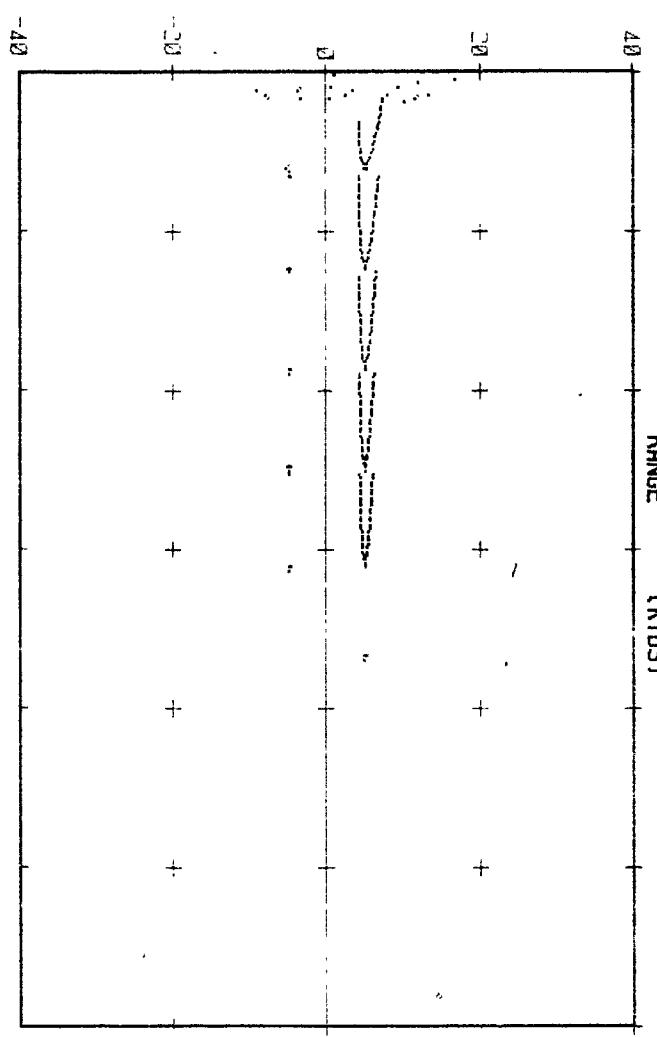
1550

L RAPP

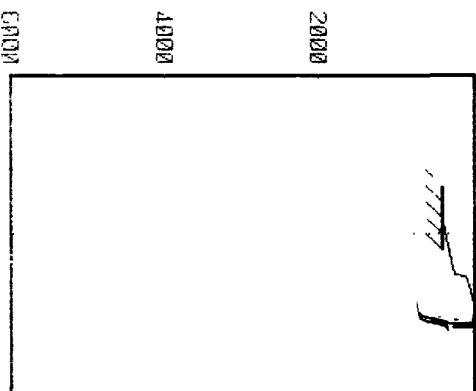
DB LOSS



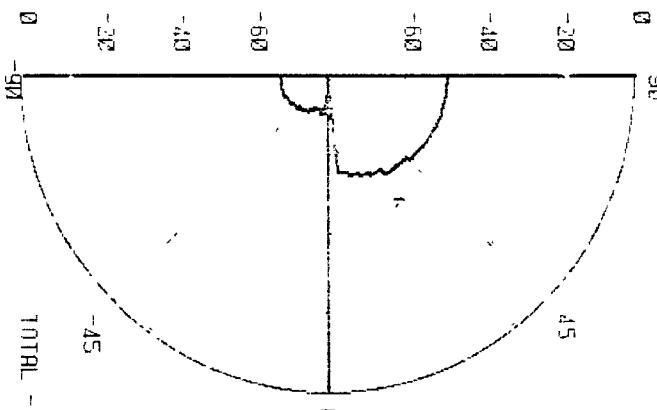
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



-120-

TOTAL - 43.9 UB

AFTER 5 WINTER

S 20 R 1000 F 900

1450 M/S

1500

1550

L RAPP

DB LOSS

90

+

+

+

+

+

+

+

130

40

+

+

+

+

+

+

+

+

+

+

+

+

+

100

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

+

70

AREA 5 WINTER

S

50

R

1000

F

500

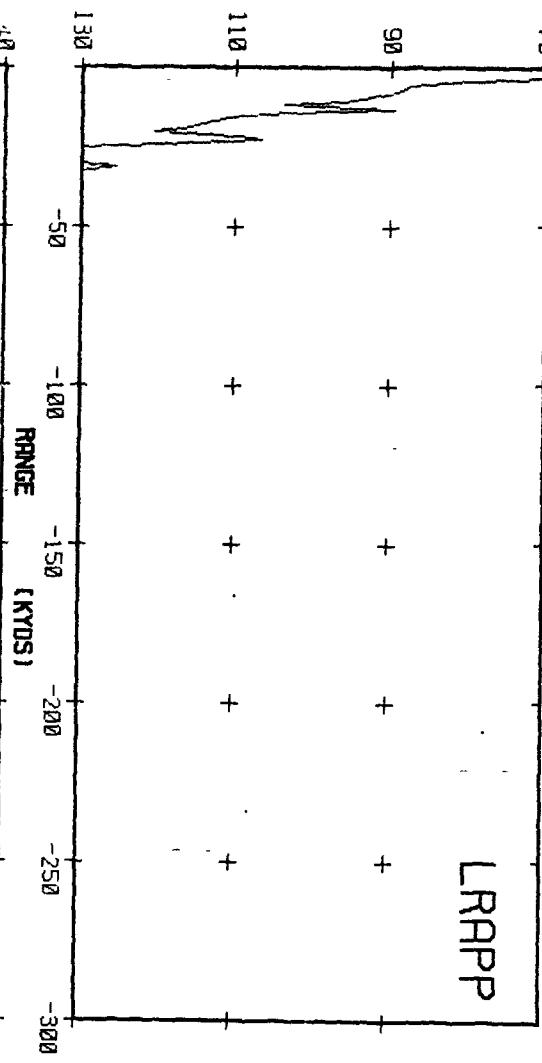
1450

M/S

1500

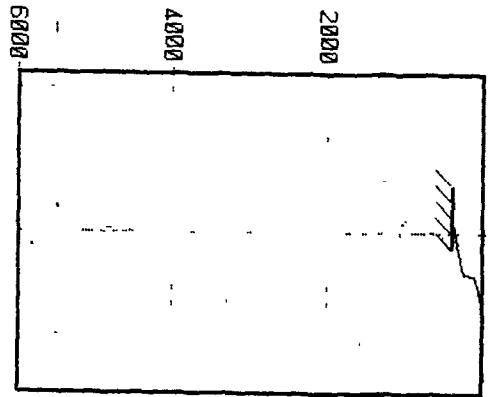
1550

DB LOSS

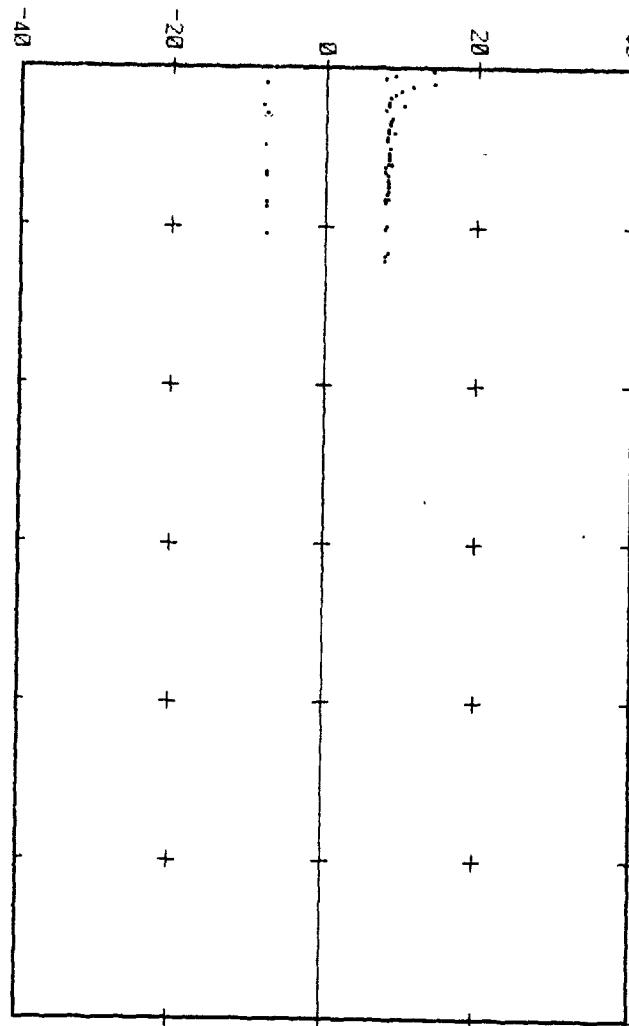


LRAPP

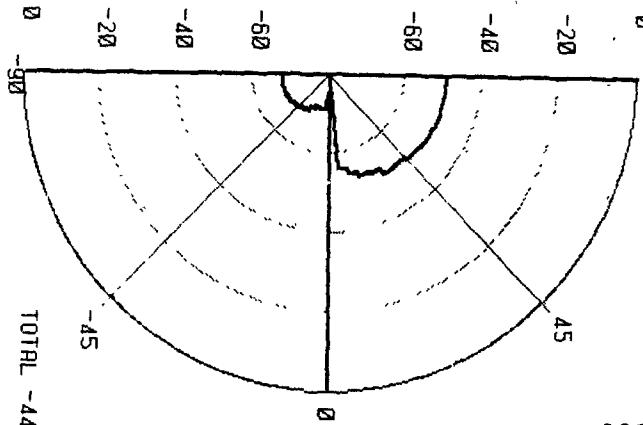
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



70

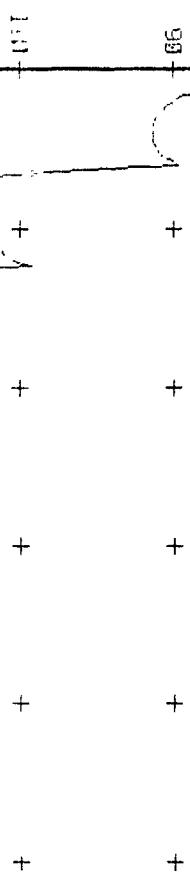
AREA 5 WINTER

S 1020 R 1000 F 900

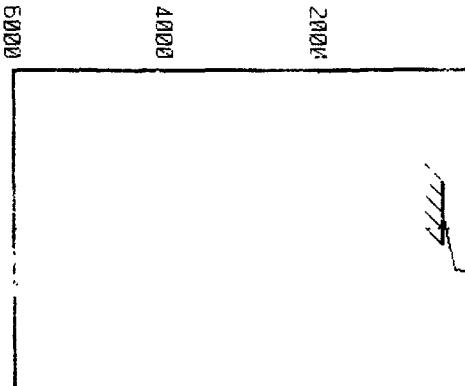
1450 M/S 1500 1550

LRAPP

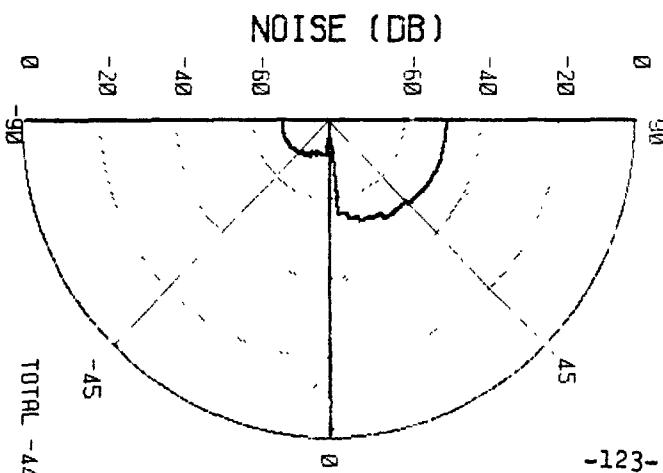
DB LOSS



DEPTH IN METERS



NOISE (DB)



70

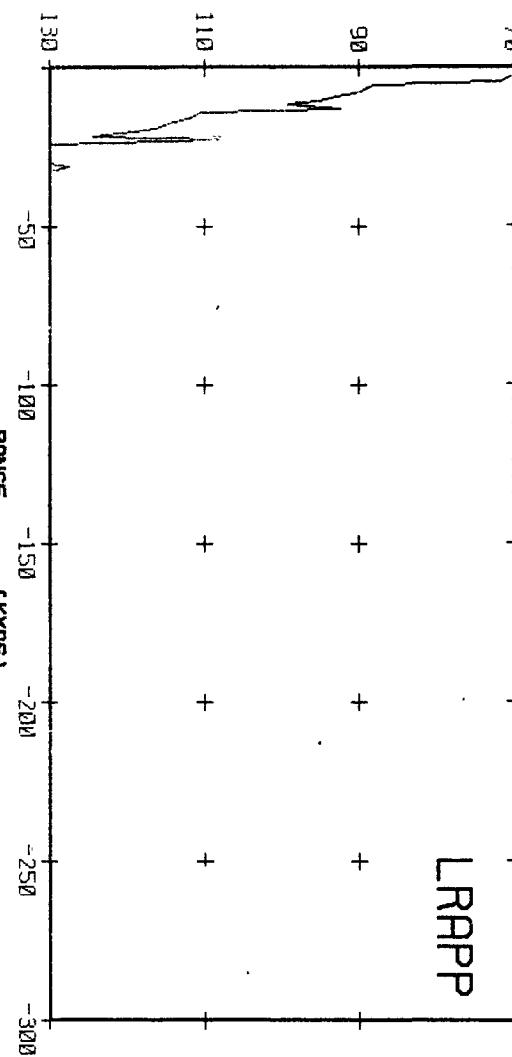
AREA 5 WINTER

S 20 R 1312 F 900

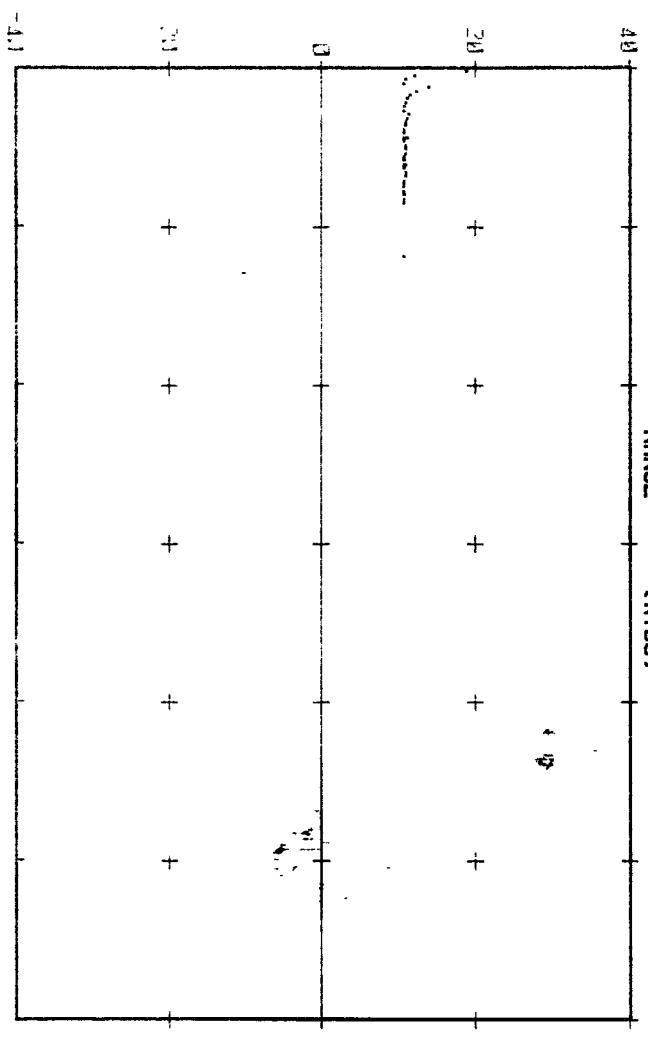
1450 M/S 1500 1550

LRAPP

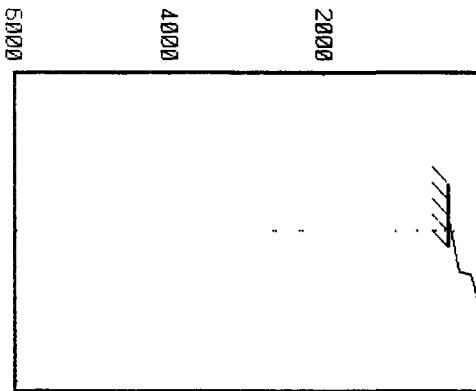
DB LOSS



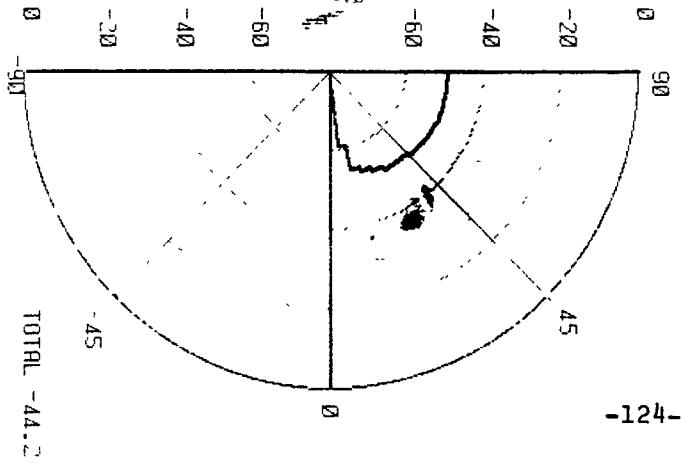
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



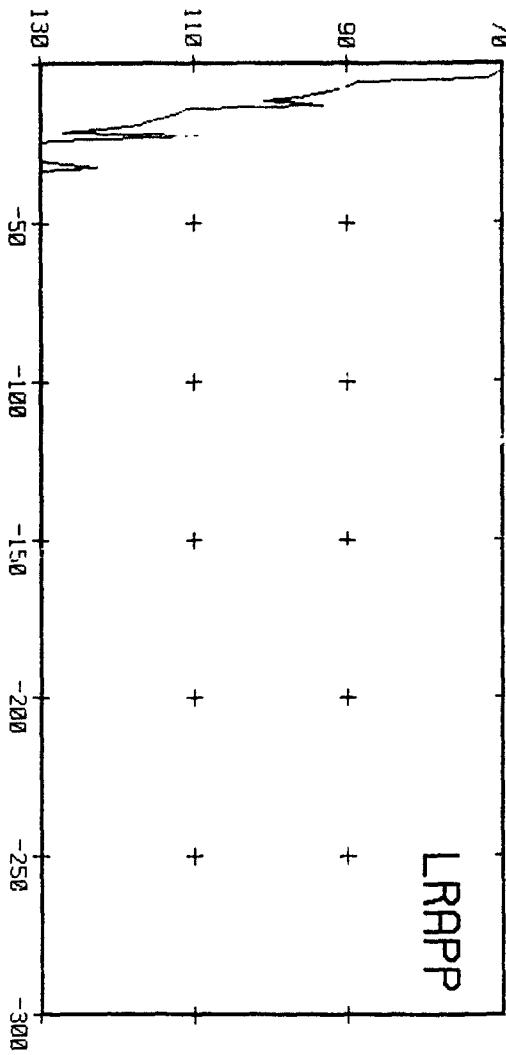
AREA 5 WINTER

S 58 R 1312 F 900

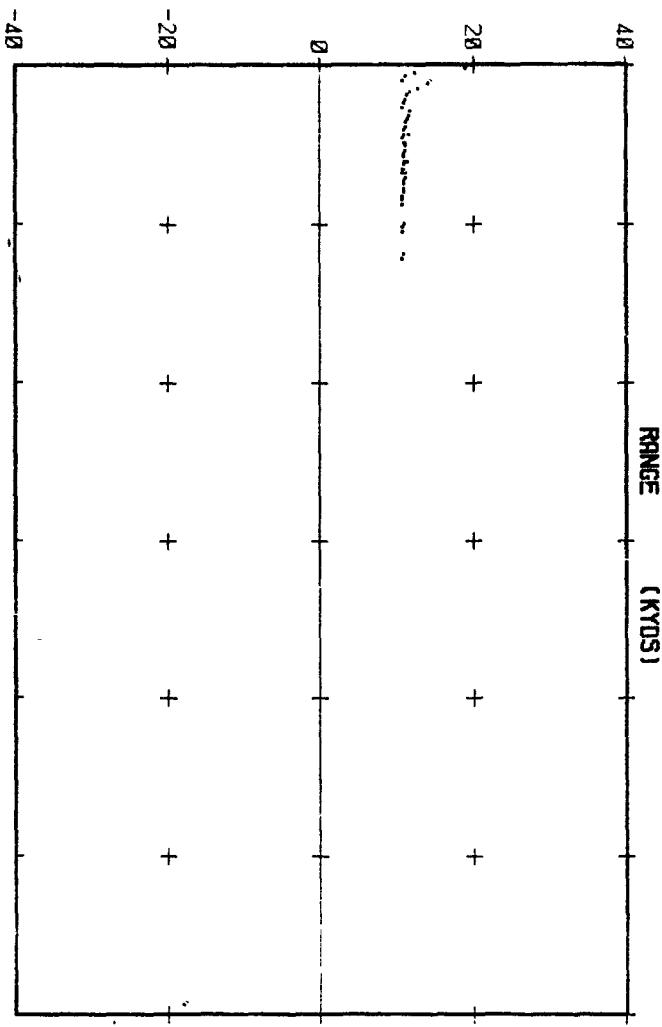
1450 M/S 1500 -1550

LRAPP

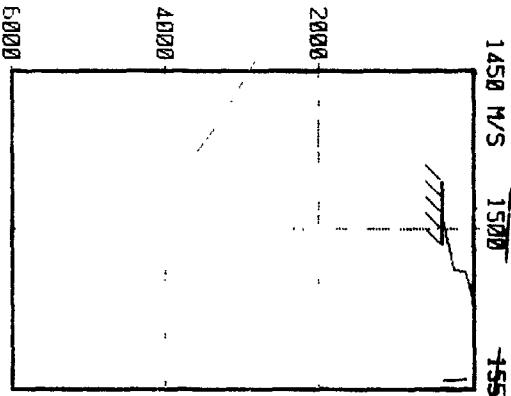
DB LOSS



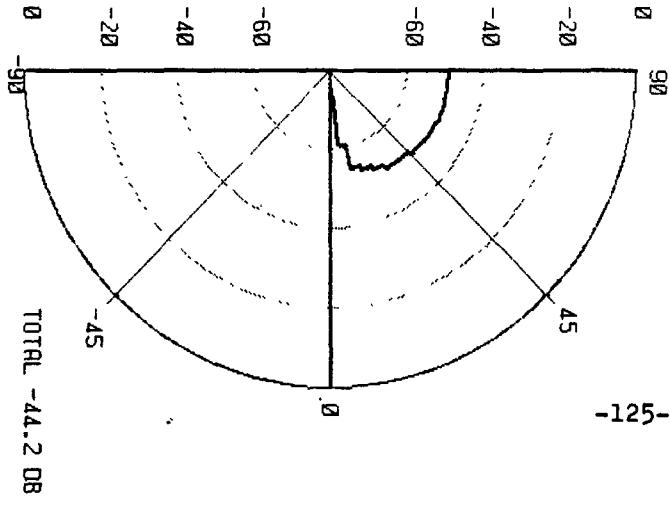
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



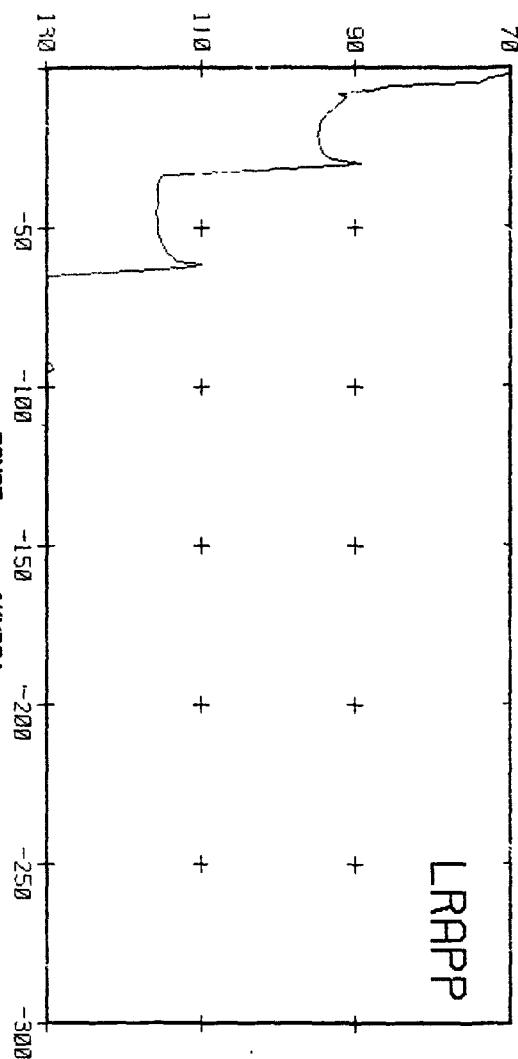
AREA 5 WINTER

S 1020 R 1312 F 900

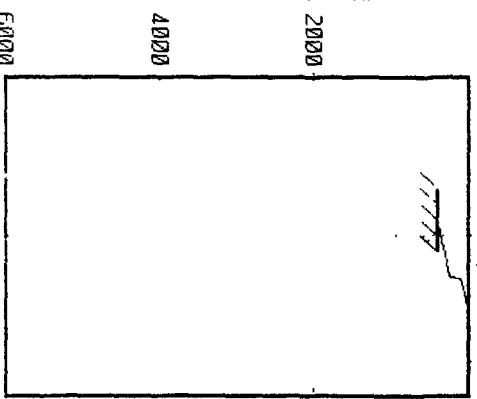
1450 M/S 1500 1550

LRAPP

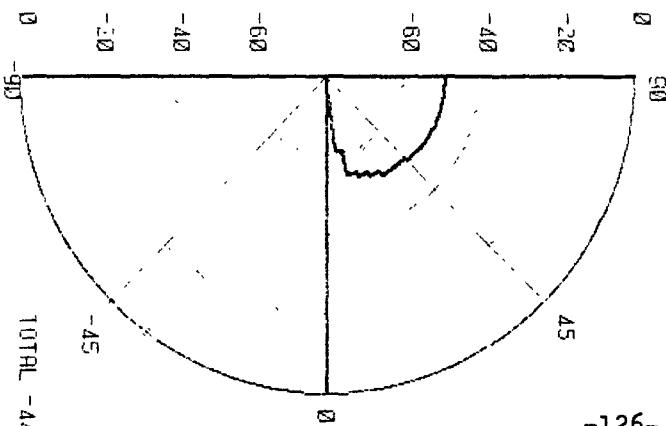
DB LOSS



DEPTH IN METERS



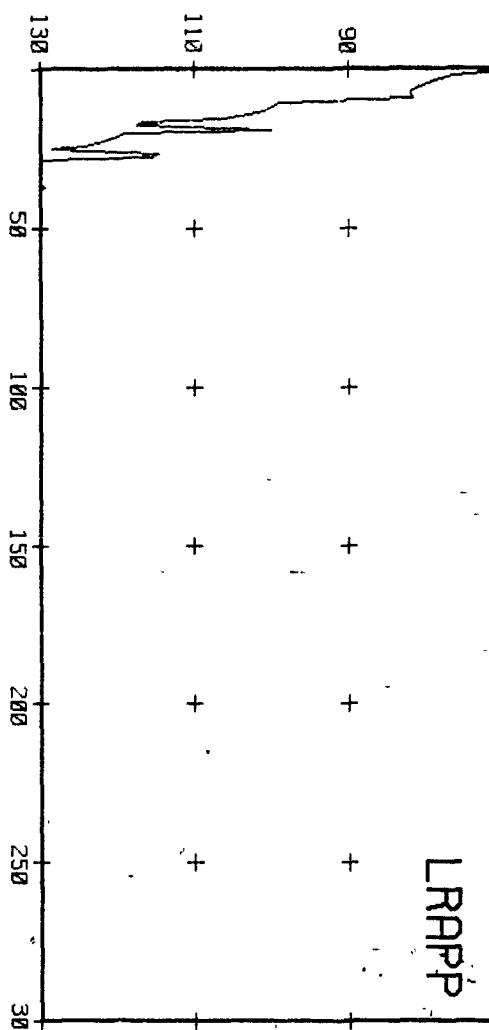
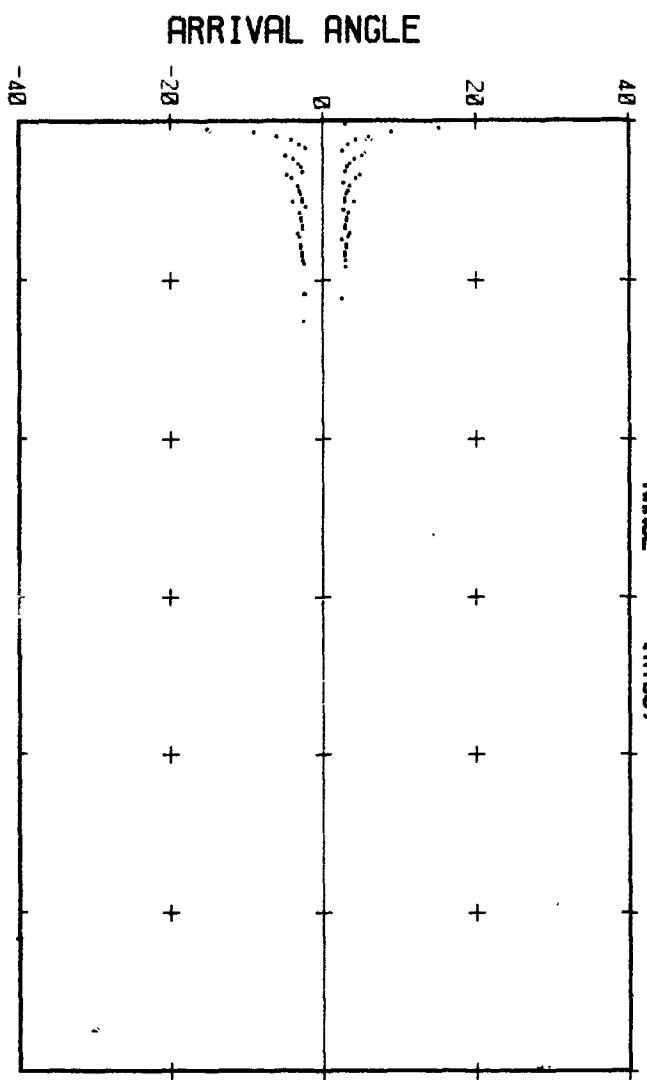
NOISE (DB)



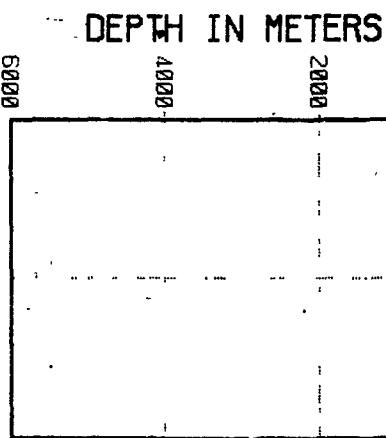
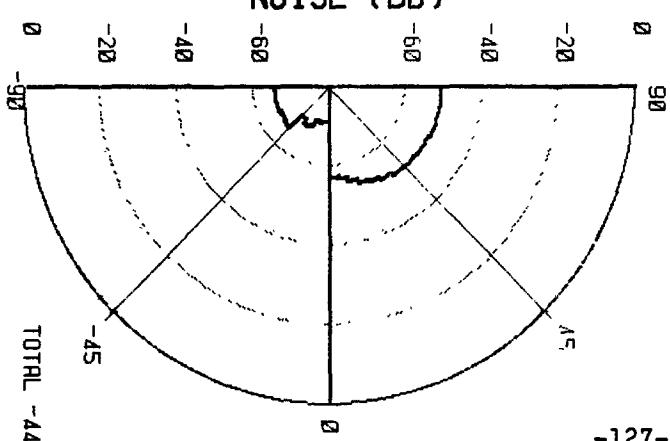
TOTAL -44.2 DBR

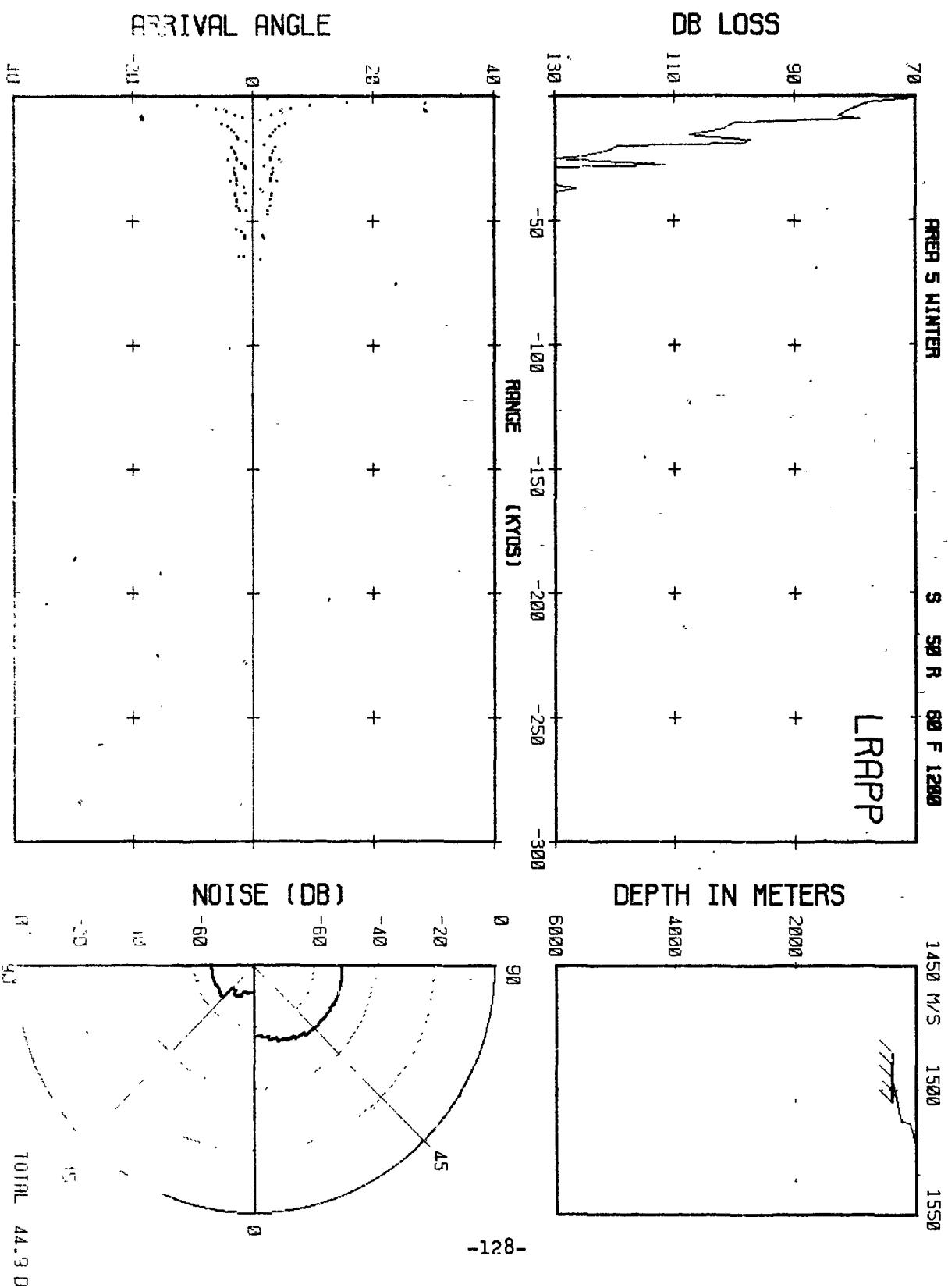
DB LOSS

78
HIGH 5 MINER
3 20K 00 P 1200
LRAPP



NOISE (DB)





70

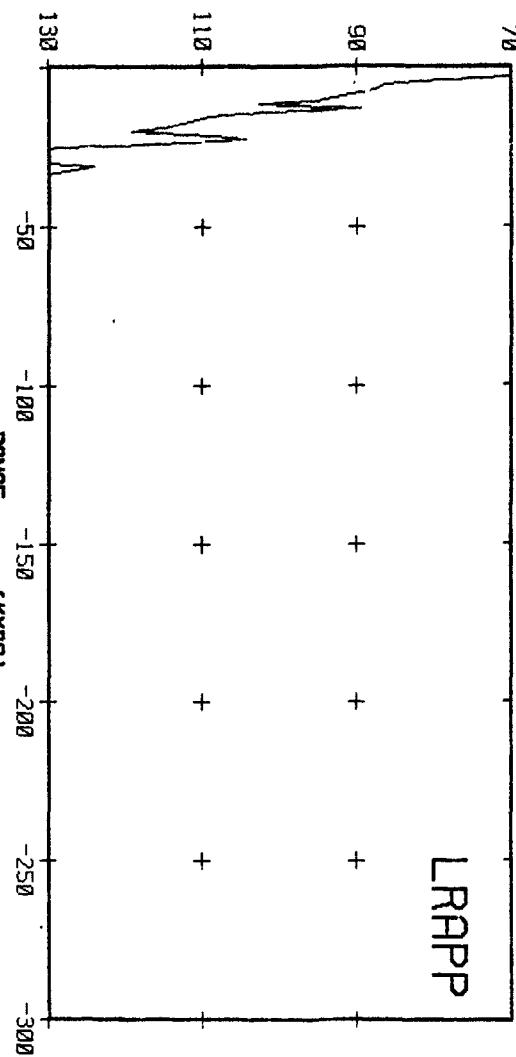
AREA 5 WINTER

S 1820 R 60 F 1200

1450 M/S 1500 1550

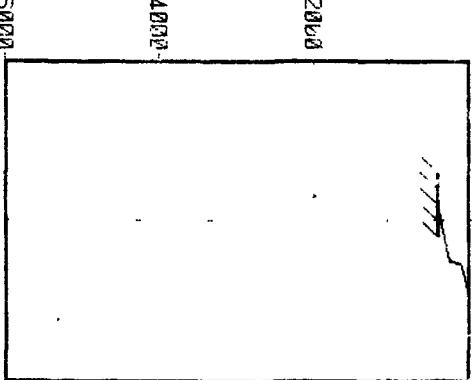
1550

DB LOSS

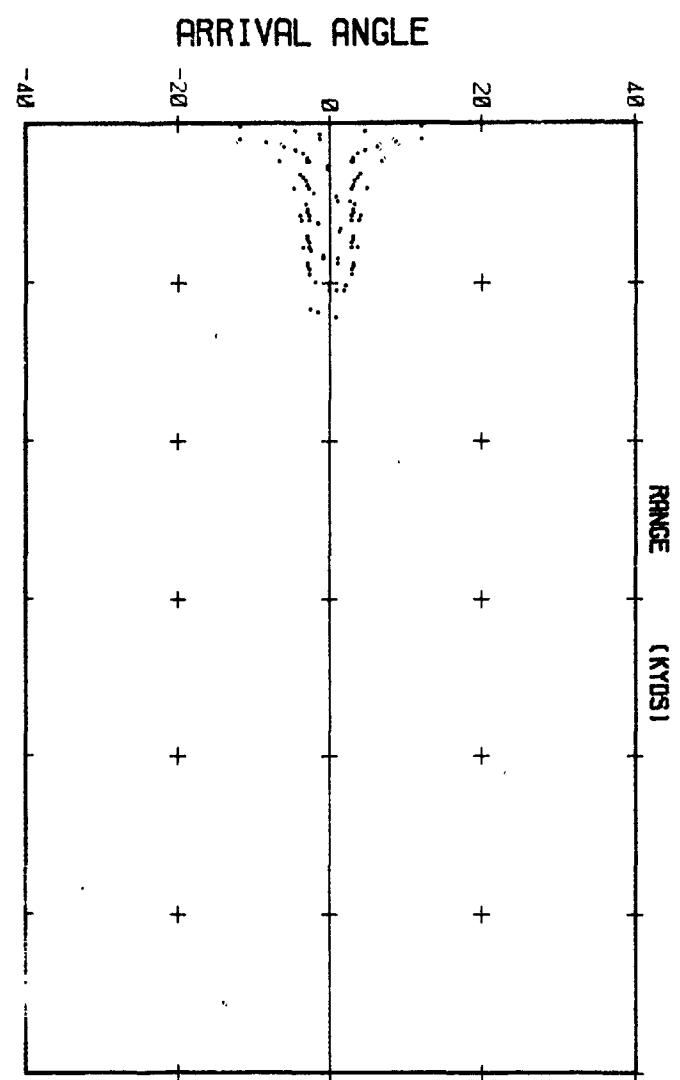


LRAPP

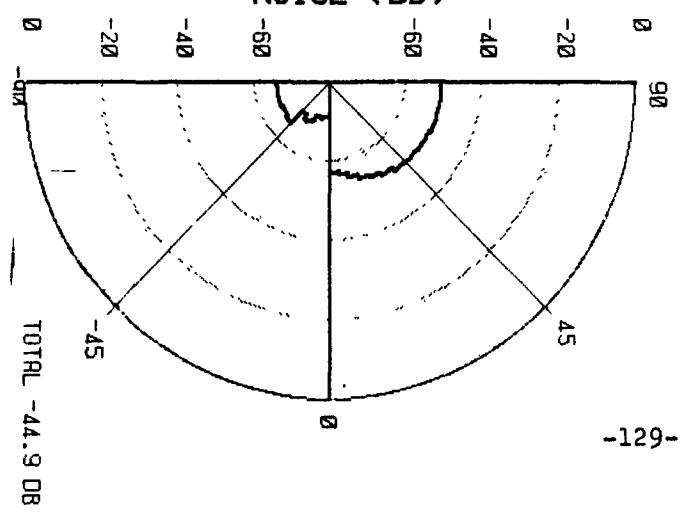
DEPTH IN METERS



NOISE (DB)



ARRIVAL ANGLE



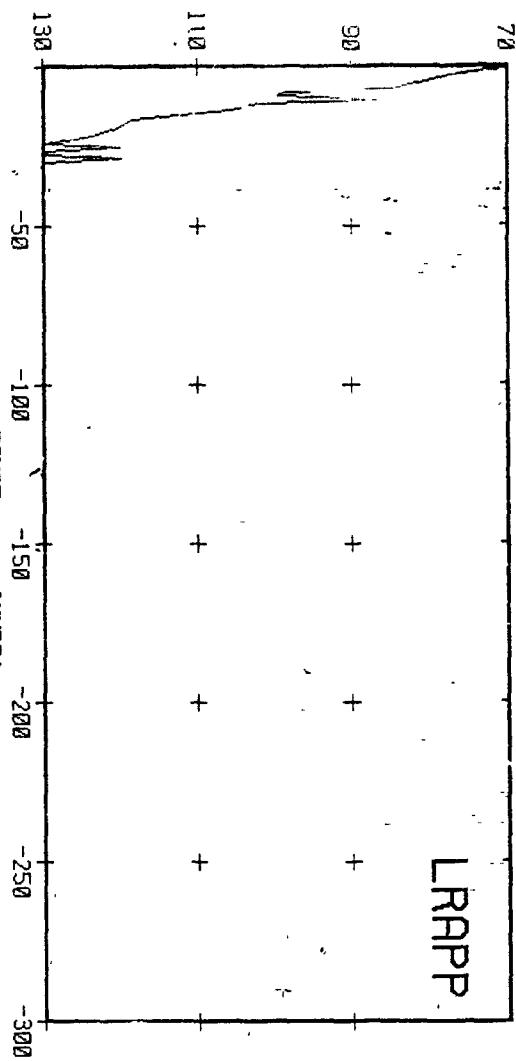
ARR 5 WINTER

S 20 R 3000 F 1200

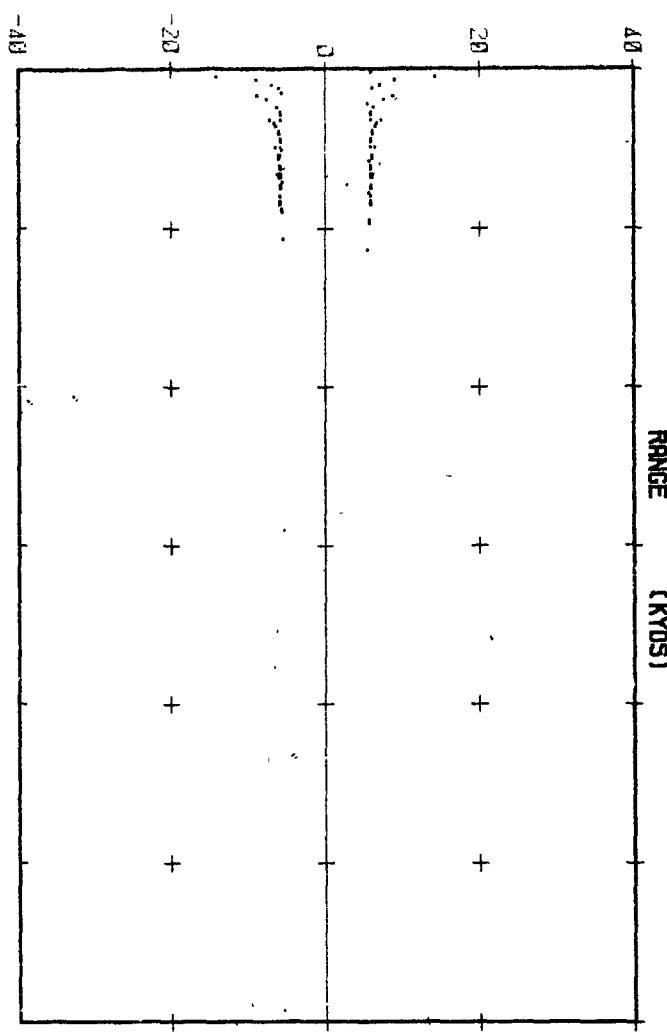
1450 M/S 1540 1550

LRAPP

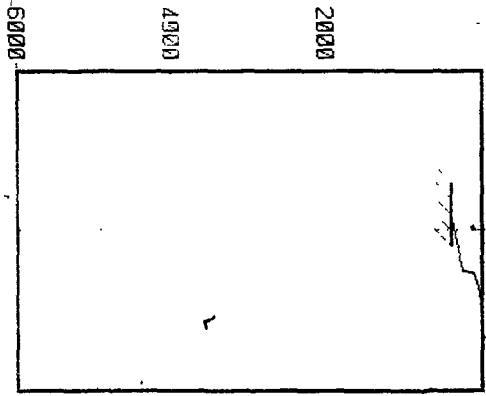
DB LOSS



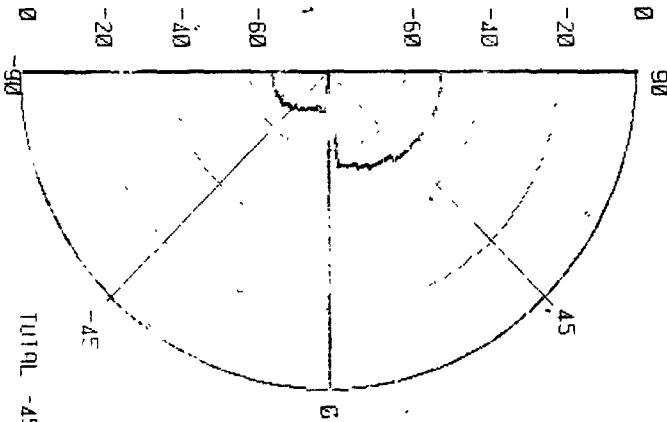
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -45.1 DB

70

AREA 5 WINTER

S SQR 300 F 1200

1450 M/S 1500 1550

LRAAPP

DB LOSS

90

+

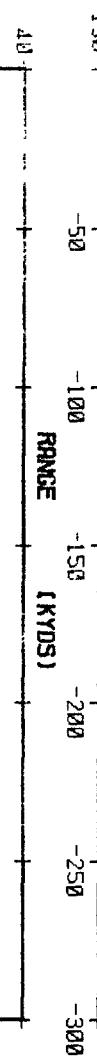
+

+

+

+

+



ARRIVAL ANGLE

20

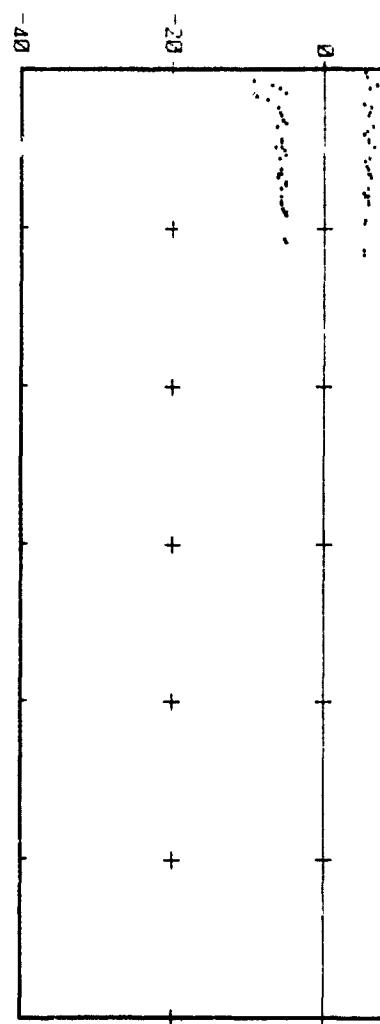
+

+

+

+

+



DEPTH IN METERS

0

6000

0

+

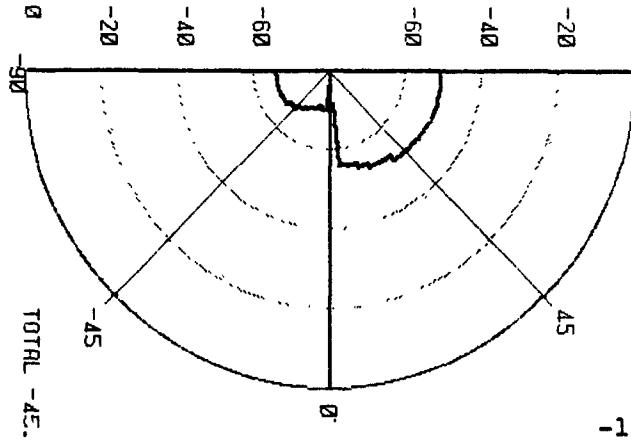


NOISE (DB)

0

0

0



TOTAL -4E. 1 DB

-131-

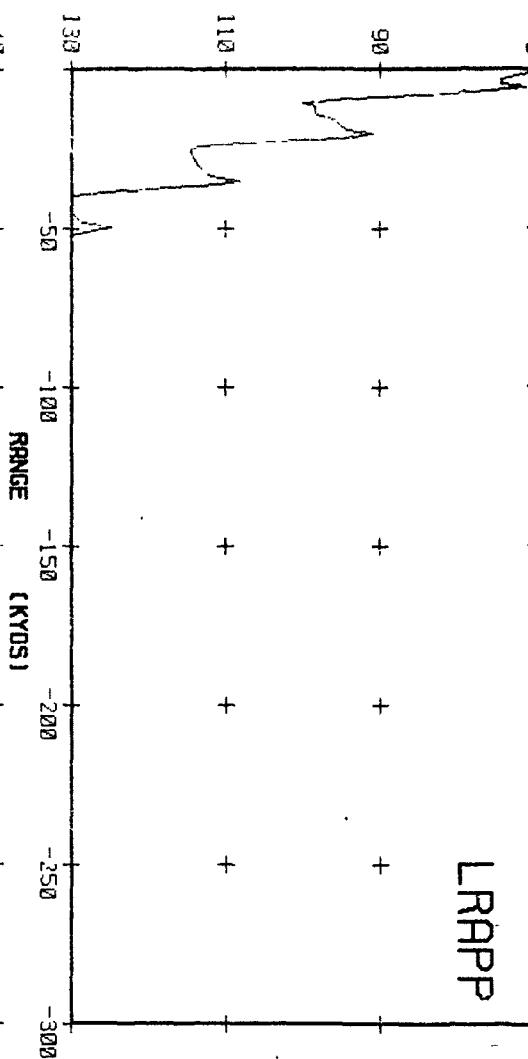
AREA 5 WINTER

S 1020 R 300 F 1200

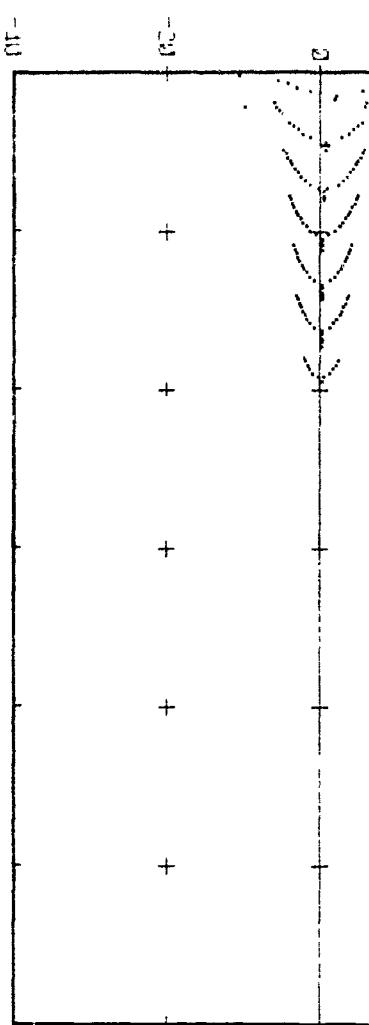
1450 M/S 1500 1550

LRAPP

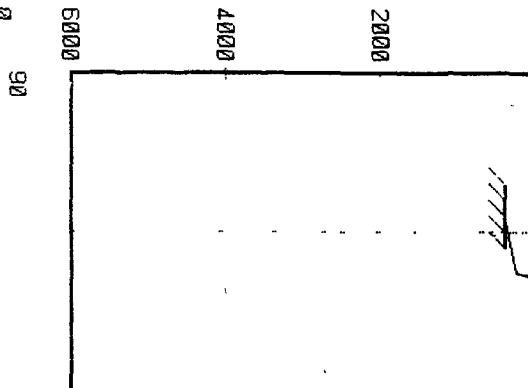
DB LOSS



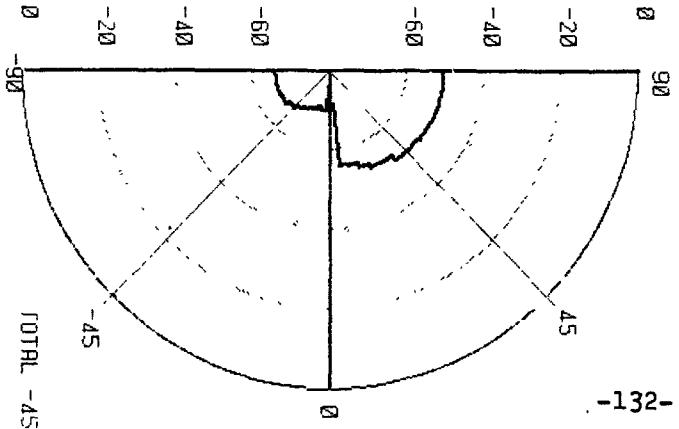
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



-132-

TOTAL -45.1 DB

70

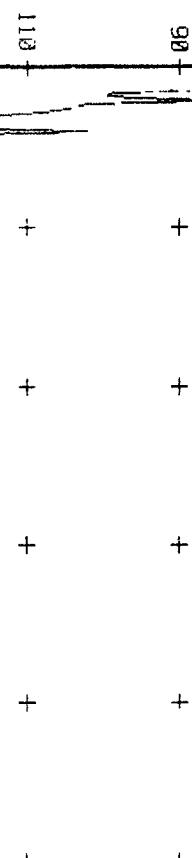
AREA 5 WINTER

S 26 R 328 F 1200

1450 M/S 1500 1550

LRAPP

DB LOSS



130

-50

-100

-150

-200

-250

-300

-320

40

0

-50

-100

-150

-200

-250

-300

-133-

DEPTH IN METERS

1000

2000

3000

4000

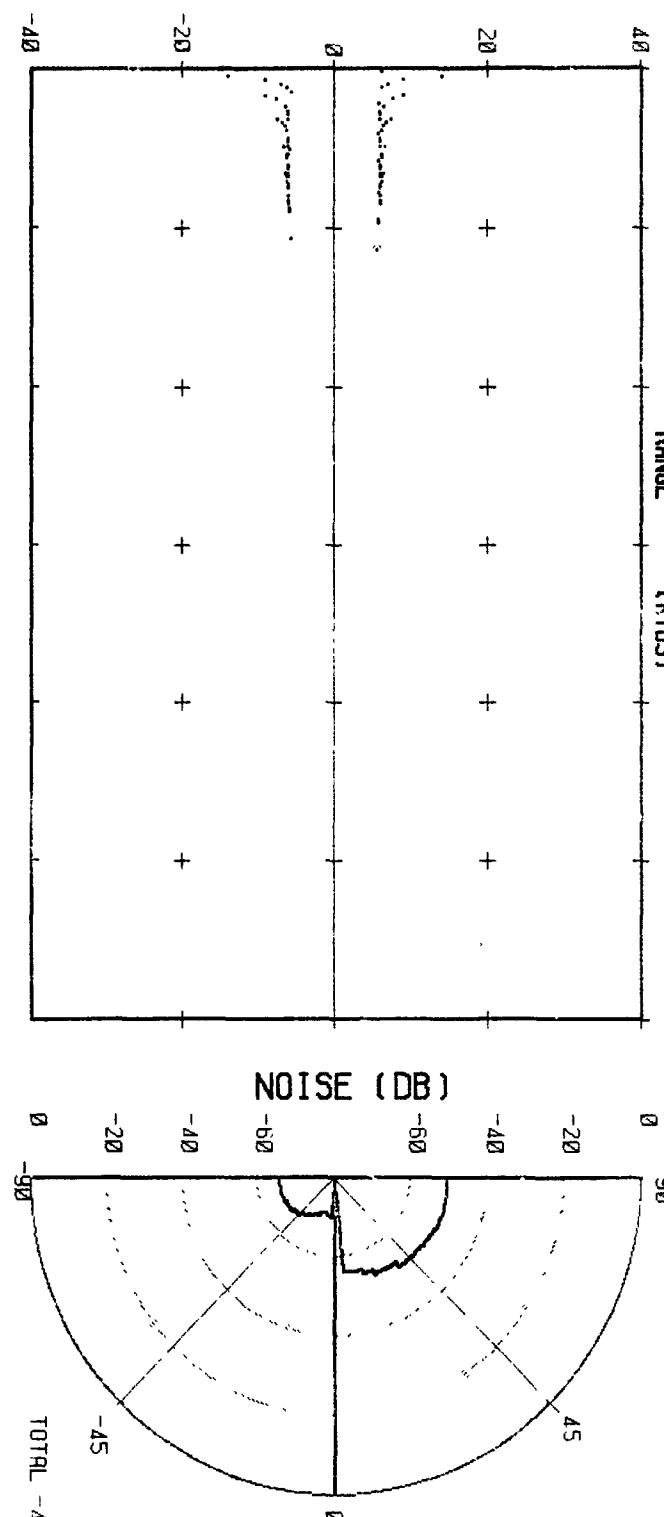
5000

6000

7000

8000

NOISE (DB)



ARRIVAL ANGLE

0

20

40

60

80

100

120

140

160

180

200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

-160

-180

-200

-20

-40

-60

-80

-100

-120

-140

AREA 5 WINTER

S 50 R 328 F 1200

1450 M/S 1500 1550

LRAPP

DB LOSS

90 + + + + +
110 + + + + +
+ + + + +
+ + + + +

130
100
40
-50 -100 -150 -200 -250 -300

RANGE [KMS]

DEPTH IN METERS

2000
1000
0

5000

3000

2000

1000

0

ARRIVAL ANGLE

20 + + + + +
-20 + + + + +
0 + + + + +

0

0

0

0

0

0

0

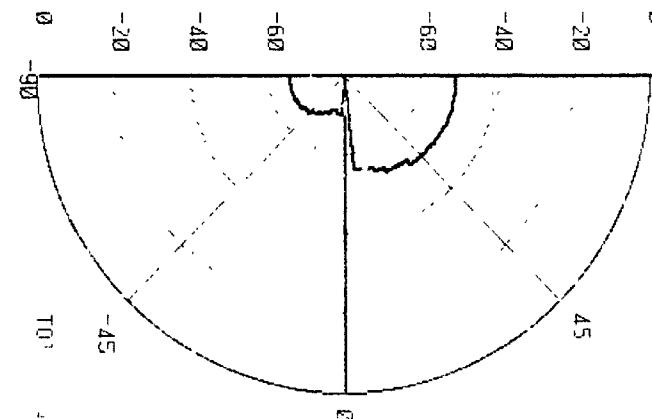
0

0

0

0

NOISE (DB)



TO 1 DB

-134-

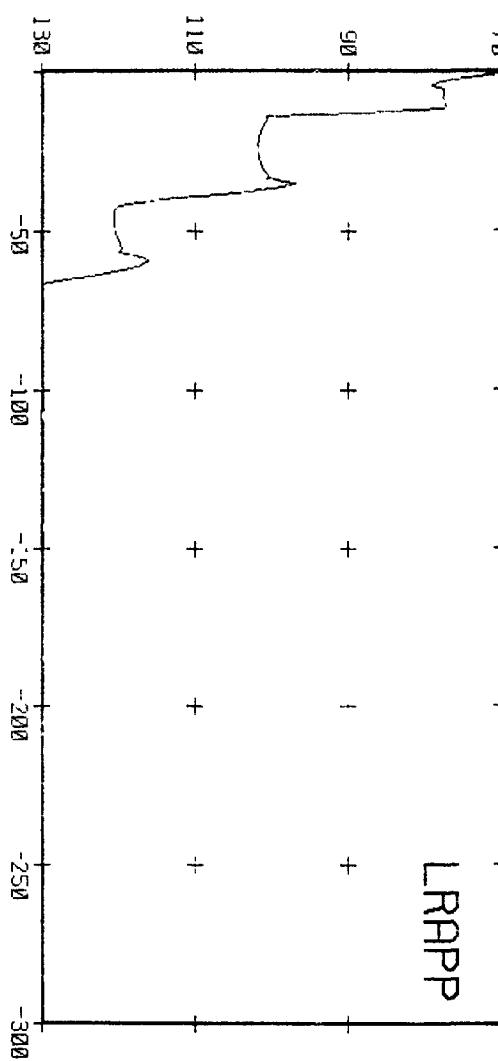
AREA 5 WINTER

S 1020 R 328 F 1200

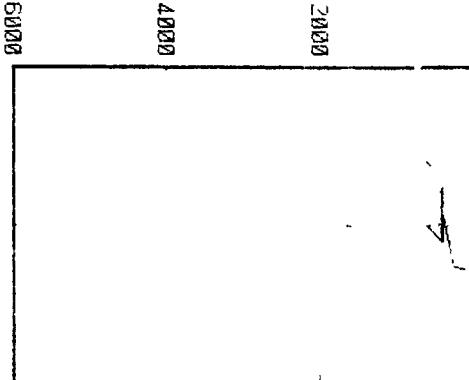
1450 450 1500 1550

L RAPP

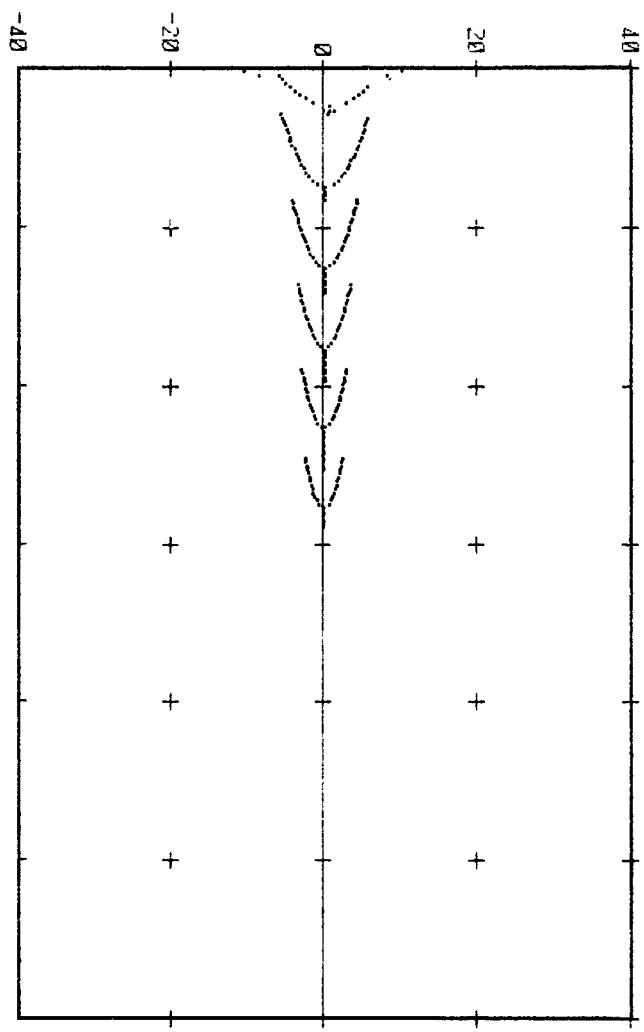
DB LOSS



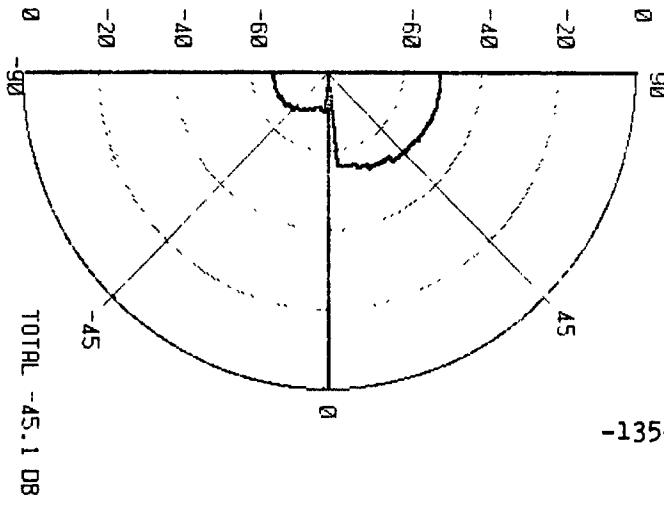
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



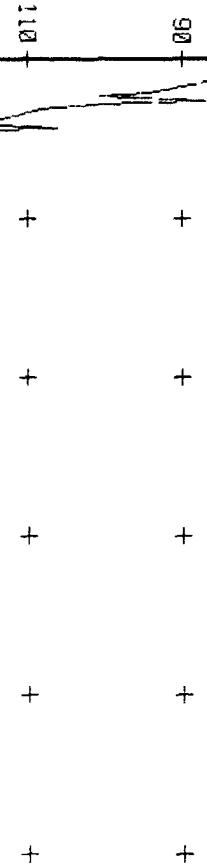
AREA 5 WINTER

S 20 R 920 F 1200

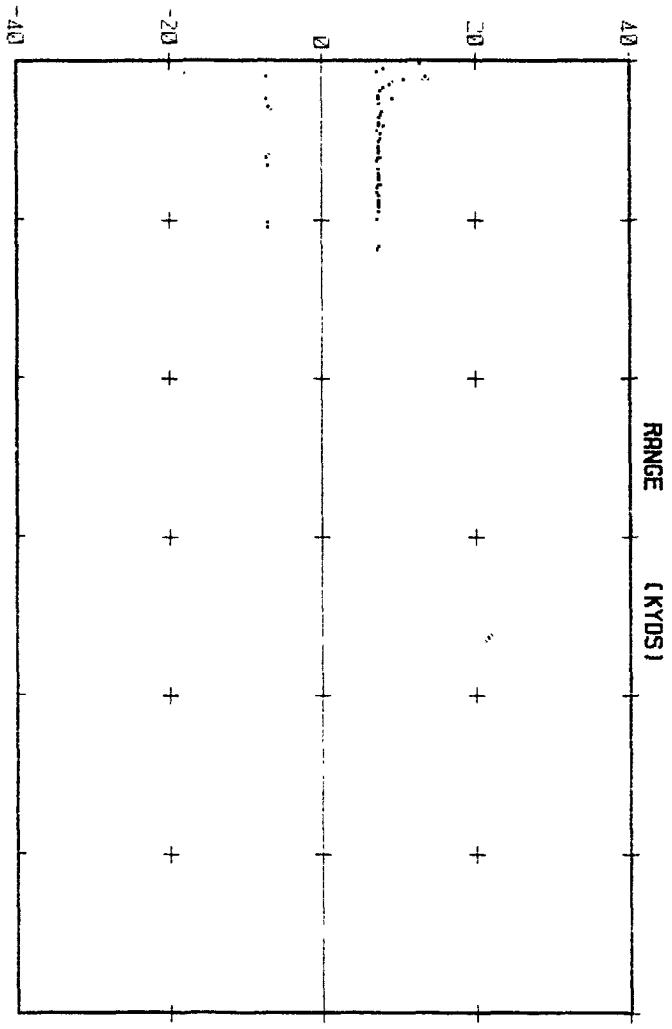
1450 M/S 1500 1550

LRAAPP

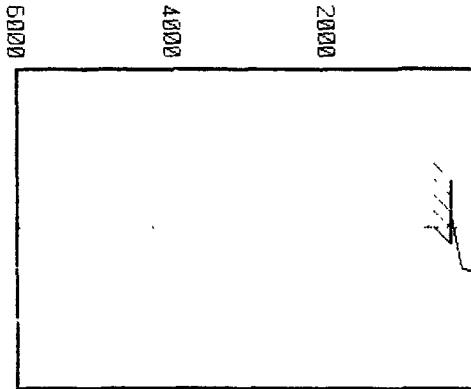
DB LOSS



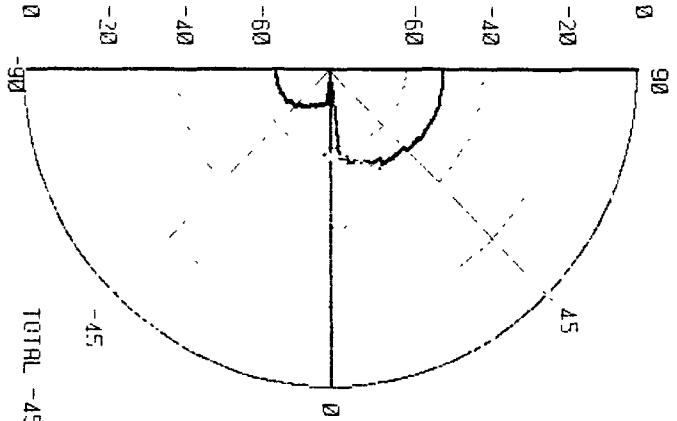
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -45.2 DB

70

AREA 5 WINTER

S 50 R 920 F 1200

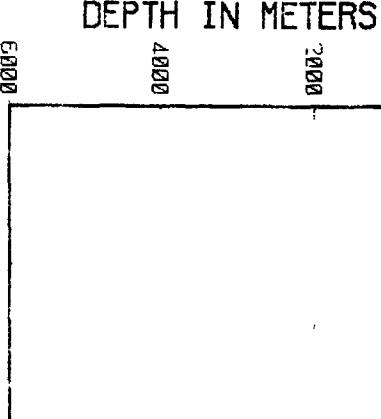
1450 M/S 1500 1550

LRAPP

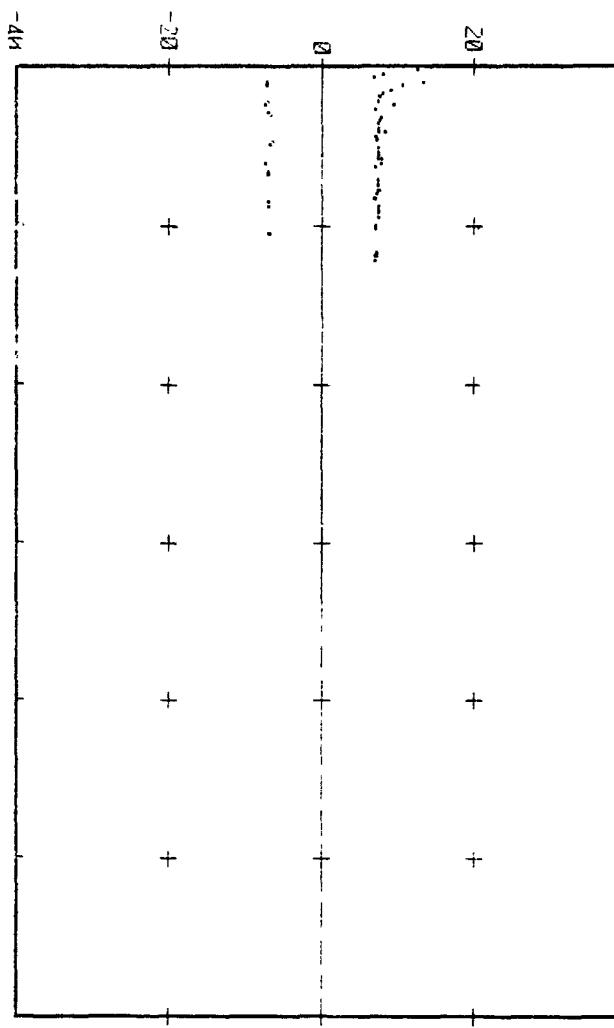
DB LOSS



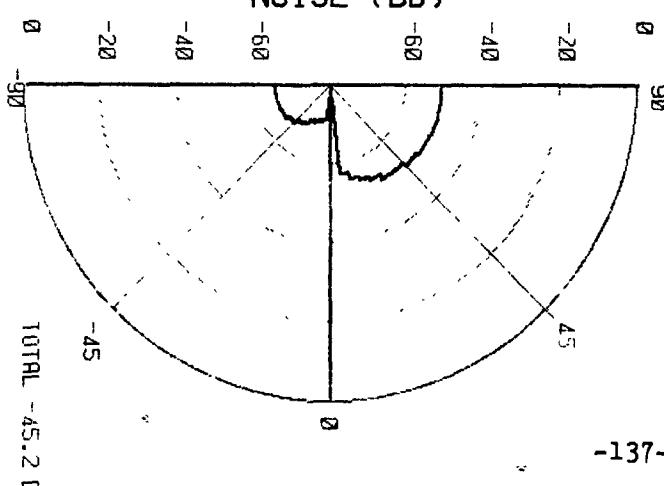
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



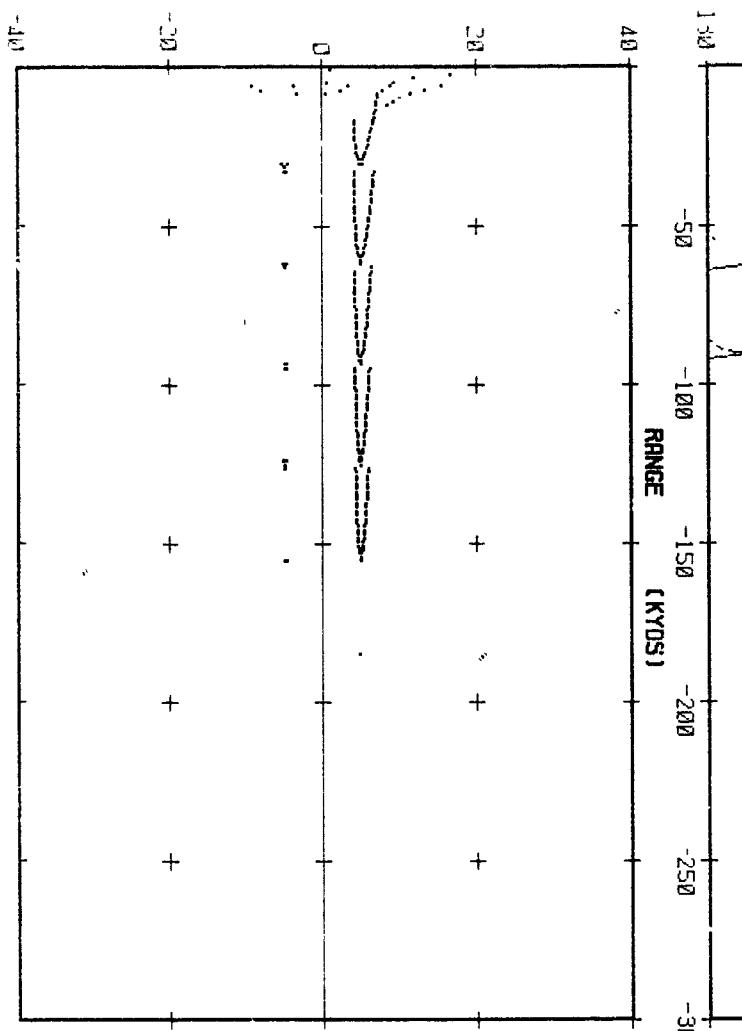
-137-



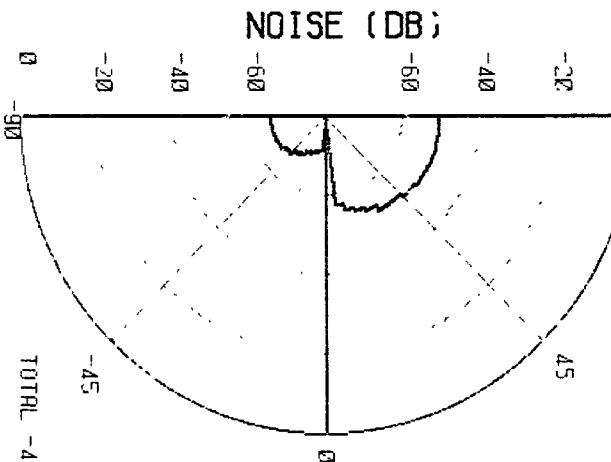
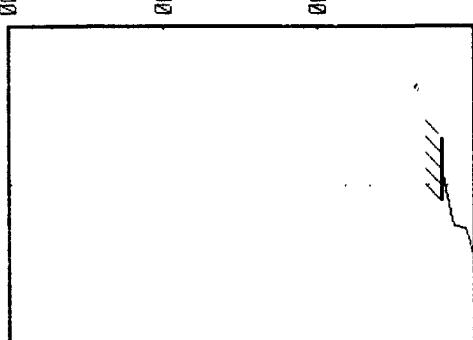
۷۲

卷之三

卷之三



DEPTH IN METERS



70

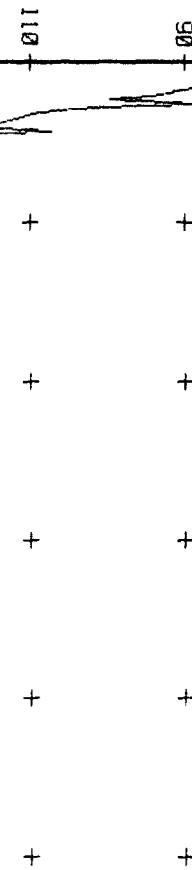
AREA 5 WINTER

S 20 R 1000 F 1200

1450 M/S 1510 1550

LRAPP

DB LOSS



DEPTH IN METERS

2000
4000

NOISE (DB)

6000

90

0

-20

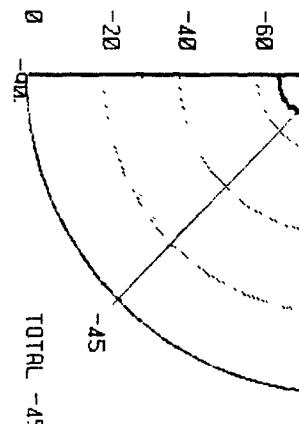
-40

-60

-80

-100

0



TOTAL -45.2 DB

-139-

RECORDED BY: R. J. HARRIS
DATE: 12/10/68

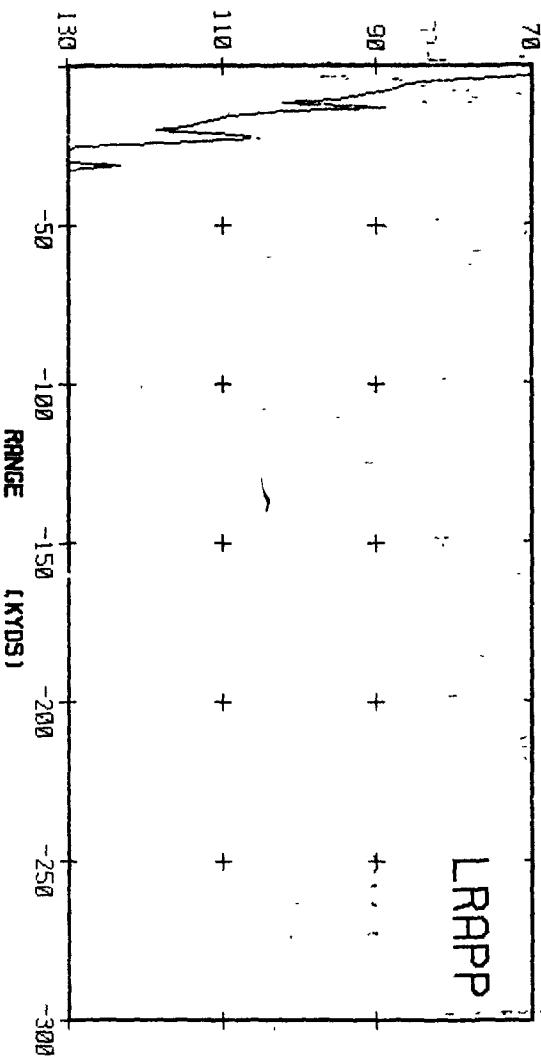
AREA 5 WINTER

S 50 R 1000 F 1200

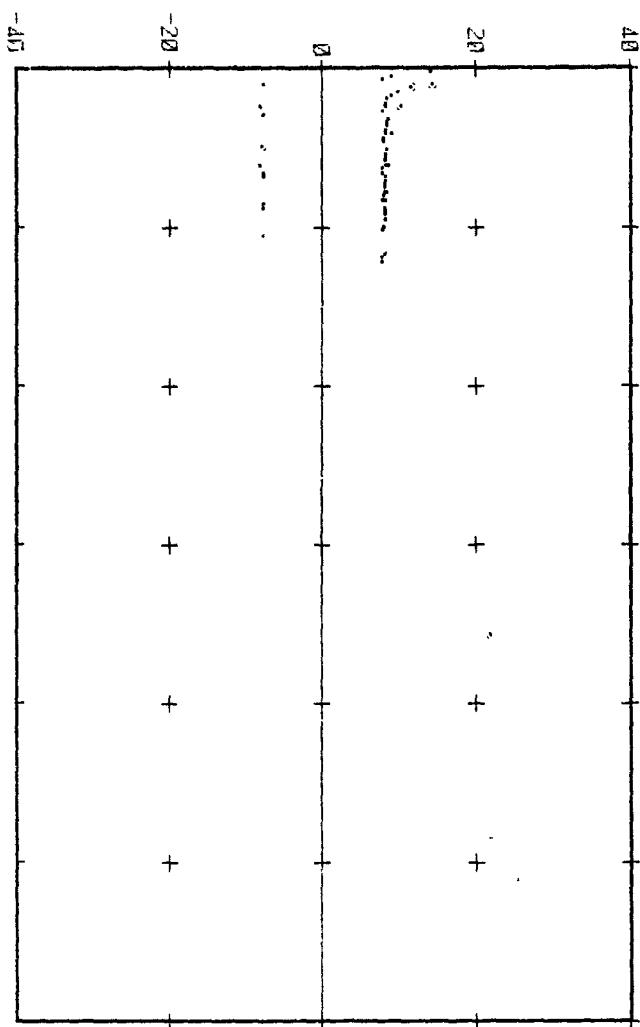
1450 M/S 1500 1550

LRAPP

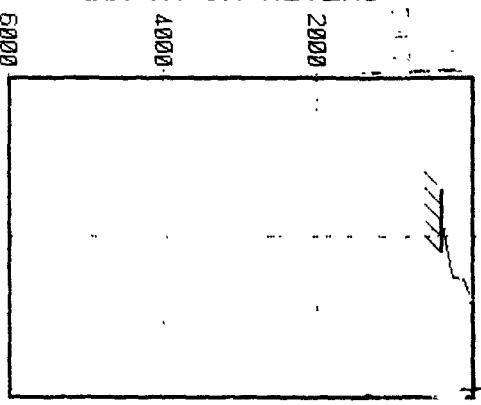
DB LOSS



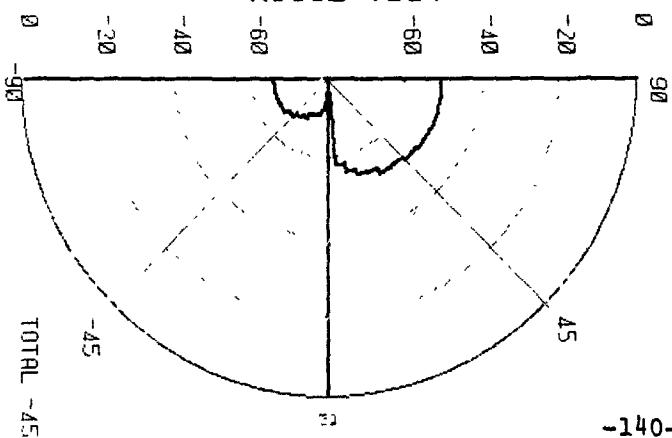
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



70

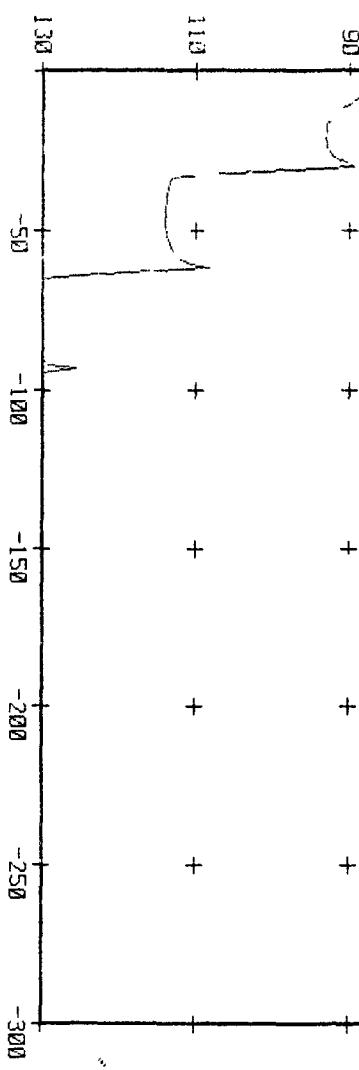
RER 5 WINTER

S 1020 F 1000 R 1200

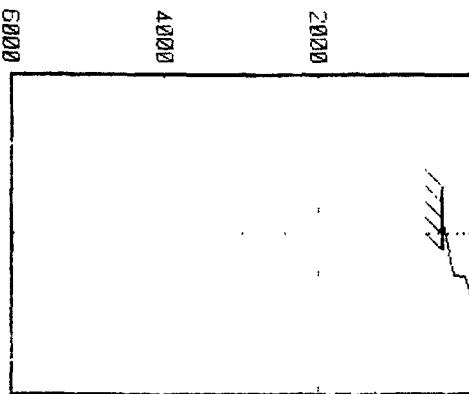
1450 M/S 1500 1550

LRAFP

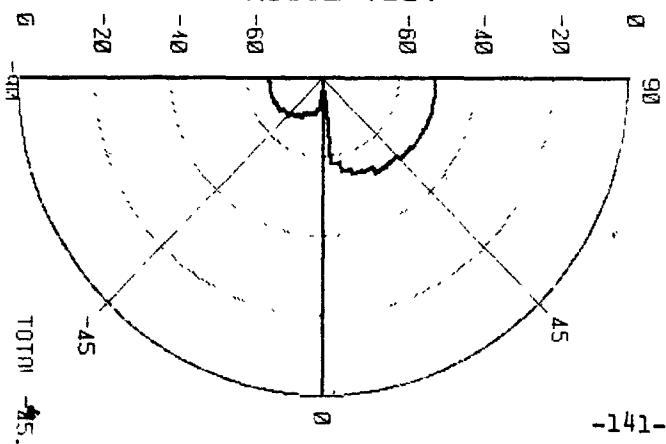
DB LOSS



DEPTH IN METERS

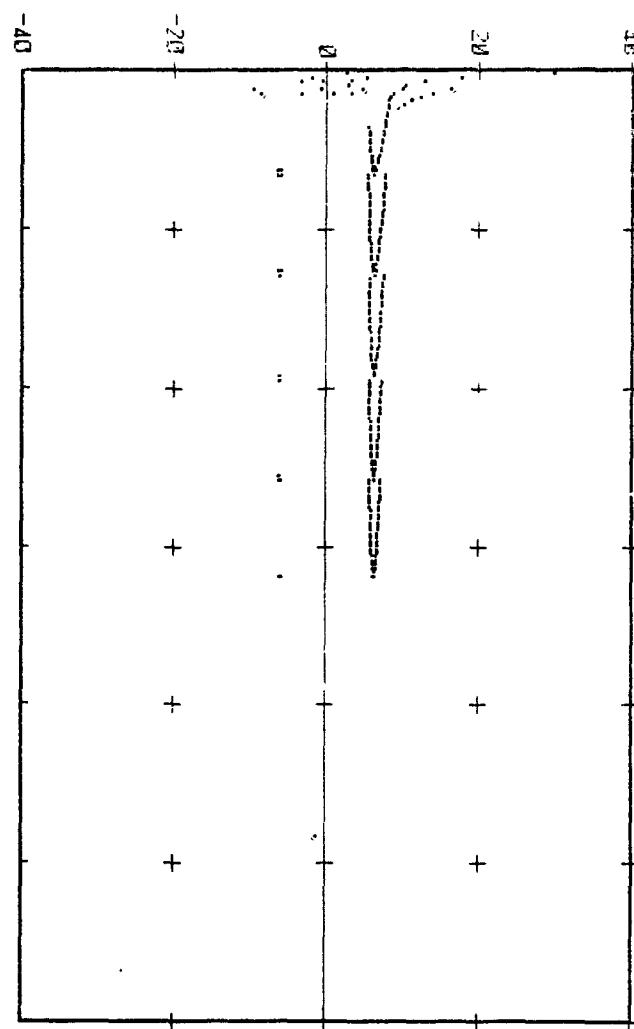


NOISE (DB)



-141-

ARRIVAL ANGLE



TOTM -45.2 DB

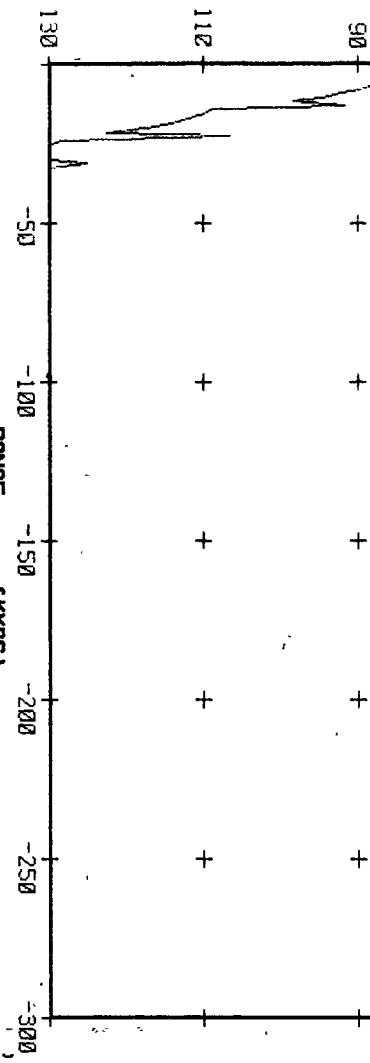
AREA 5 WINTER

S 20 R 1312 F 1200

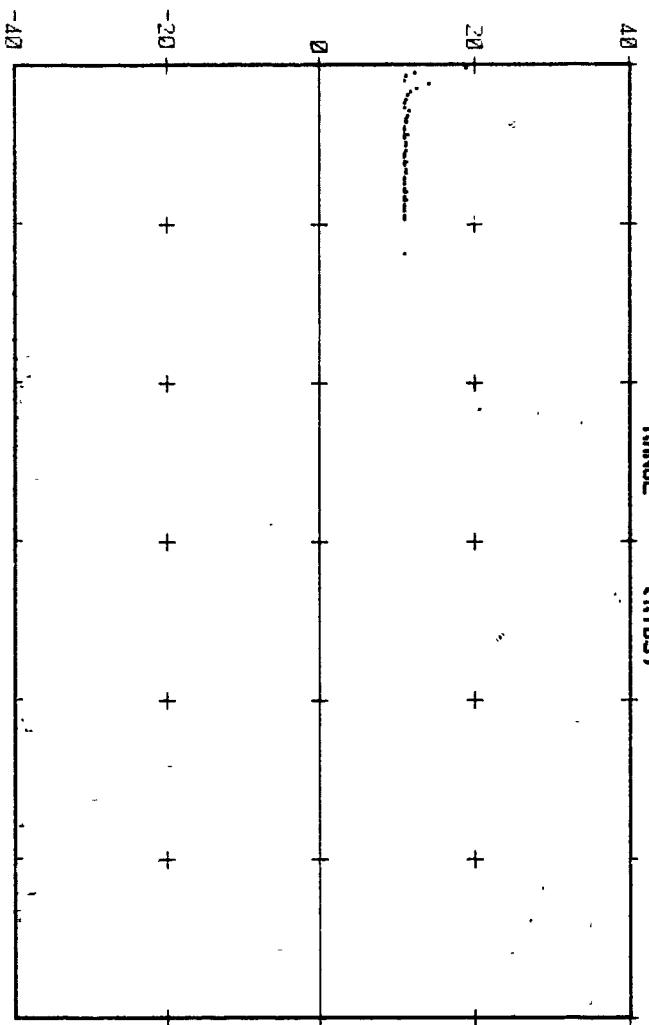
1450 M/S 1500 1550

LRAPP

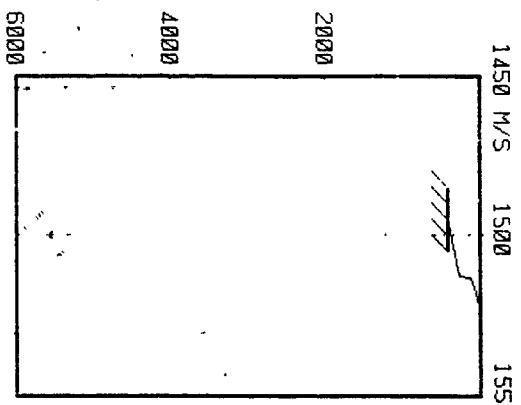
DB LOSS



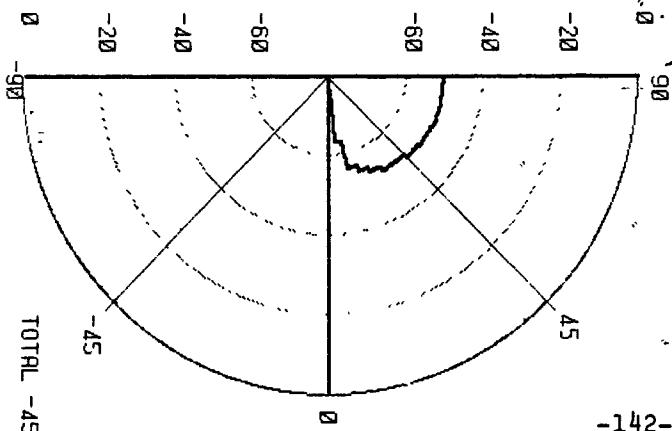
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



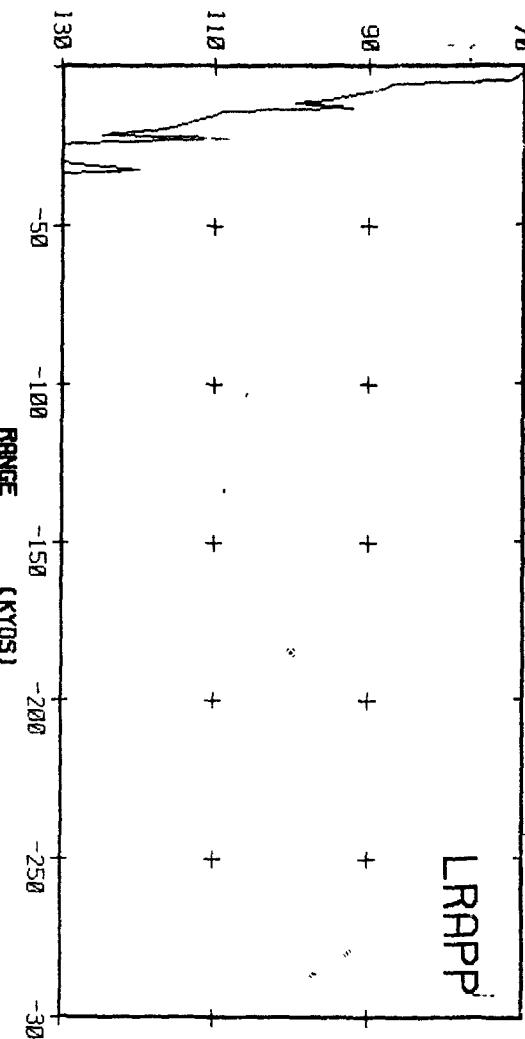
RER 5 WINTER

S 59 R 1312 F 1240

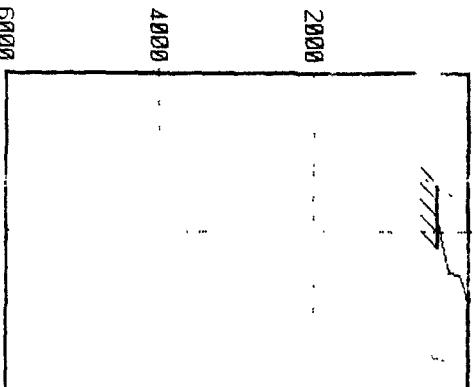
1450 M/S 1500 1550

LRAPP

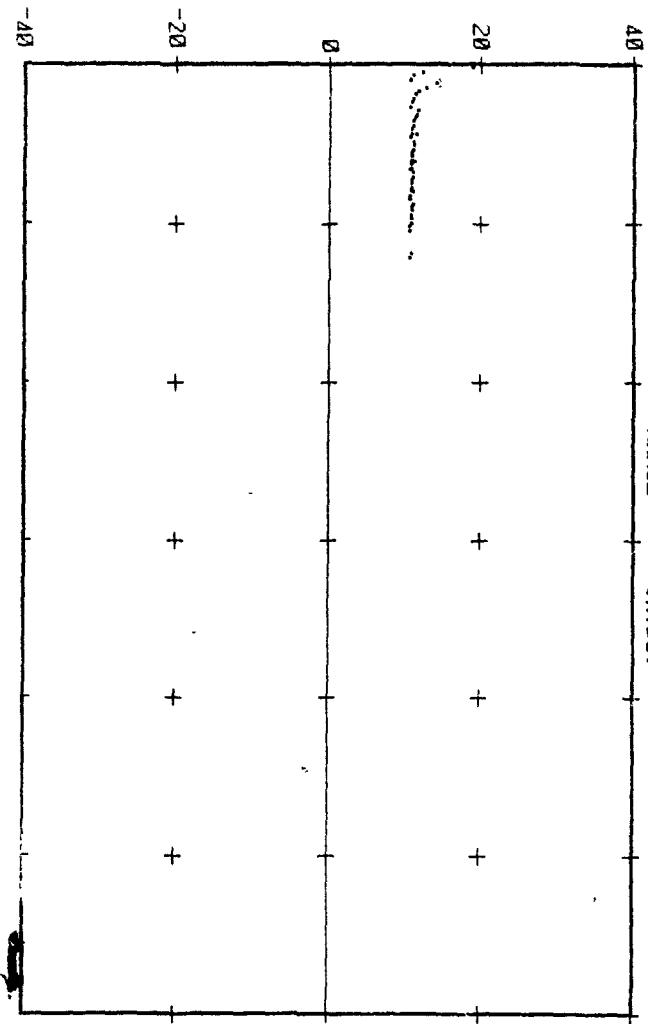
DB LOSS



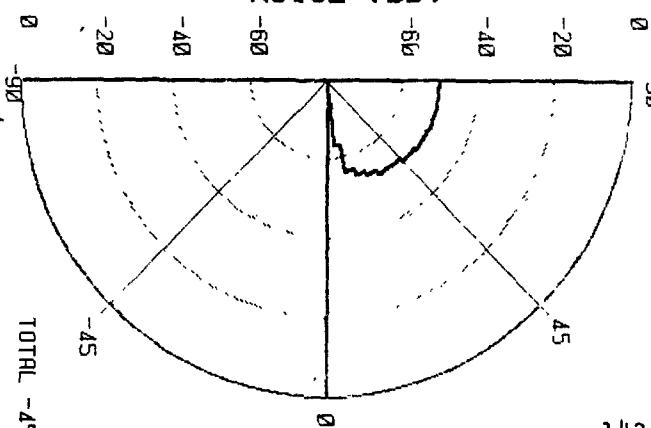
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



AREA 5 WINTER

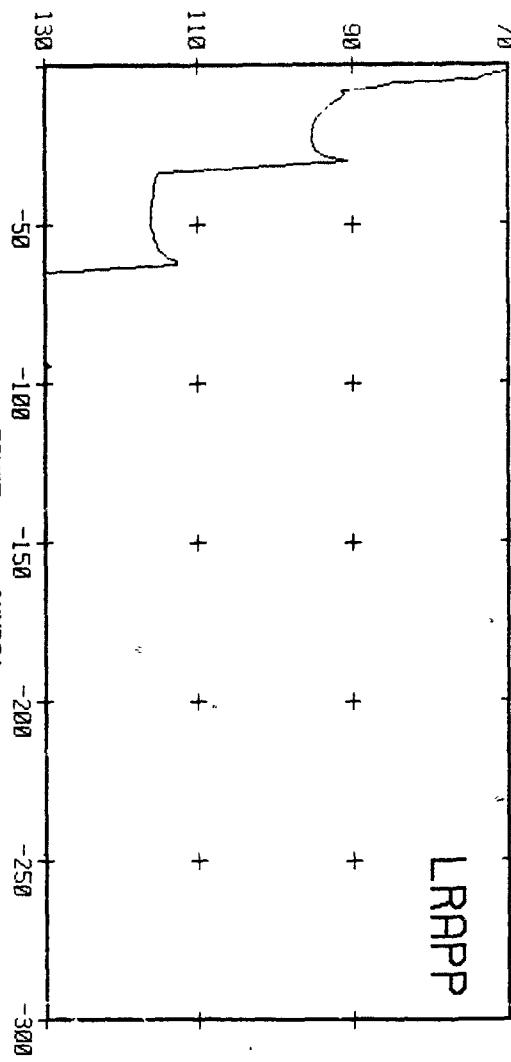
S 1020 R 1312 F 1200

1450 M/S 1500 ~1550

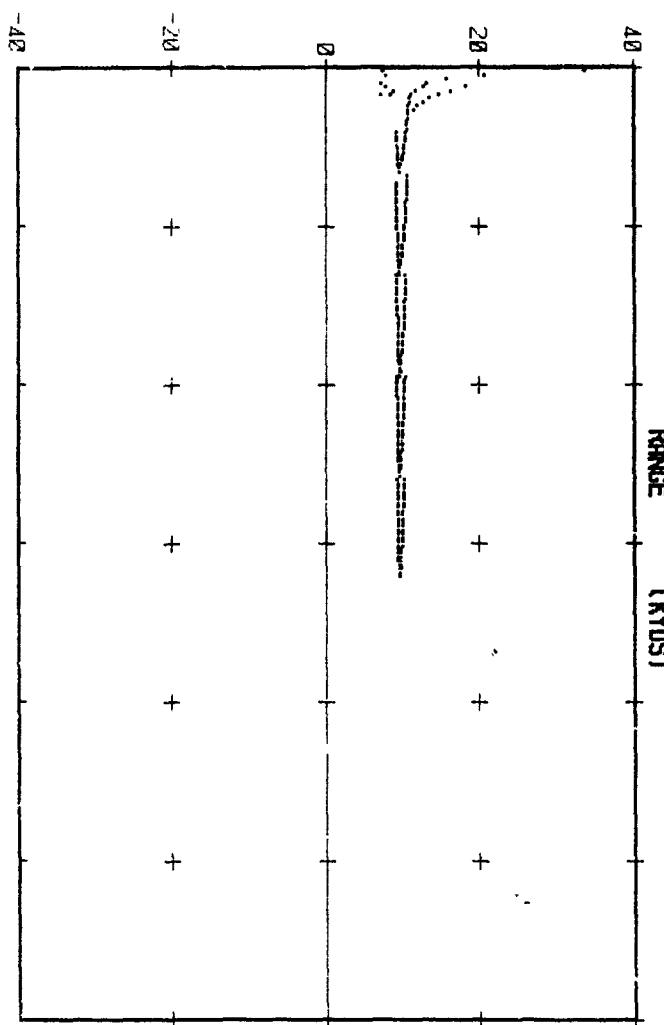
70

LRAPP

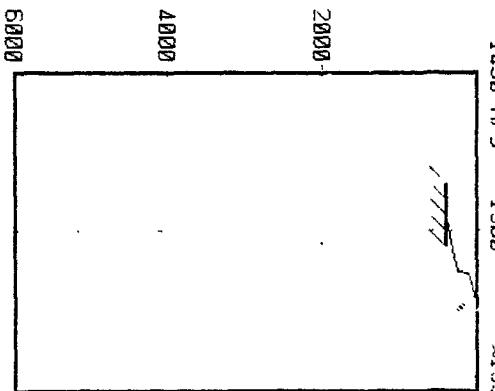
DB LOSS



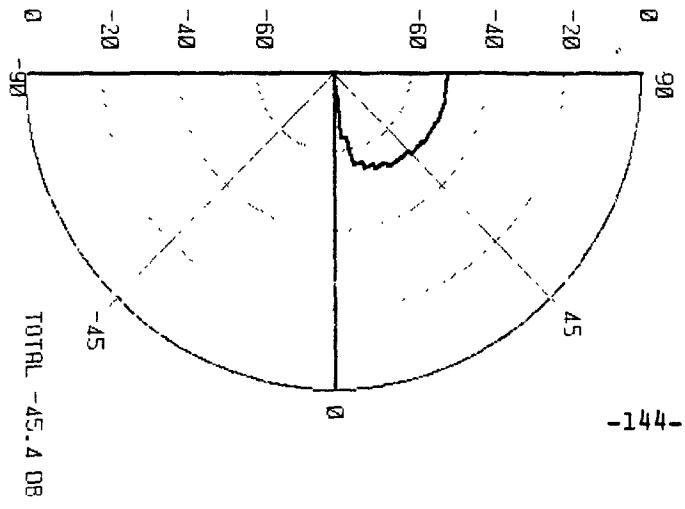
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



-144-

TOTAL -45.4 DB

78

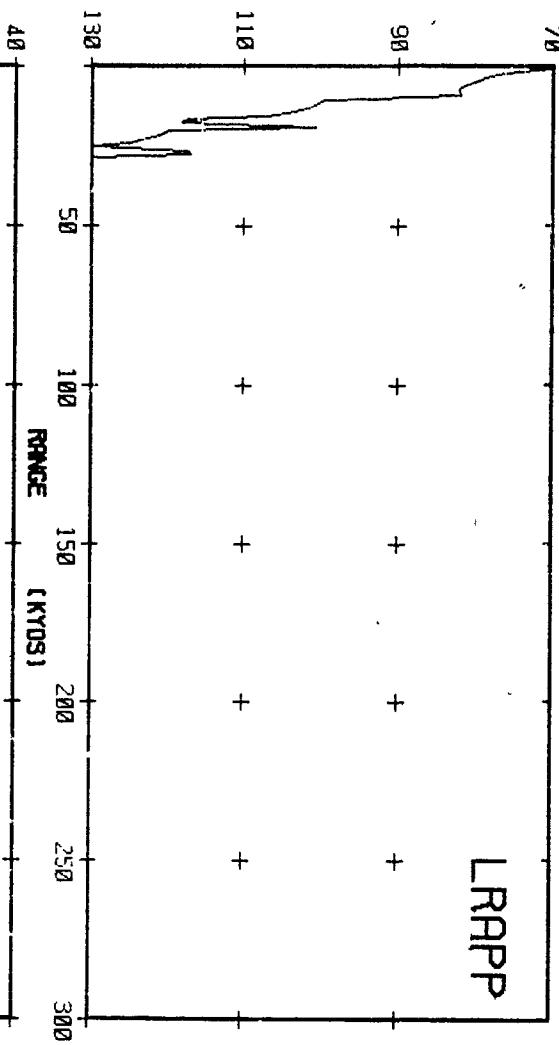
AREA 5 WINTER

S 20 R 82 F 2800

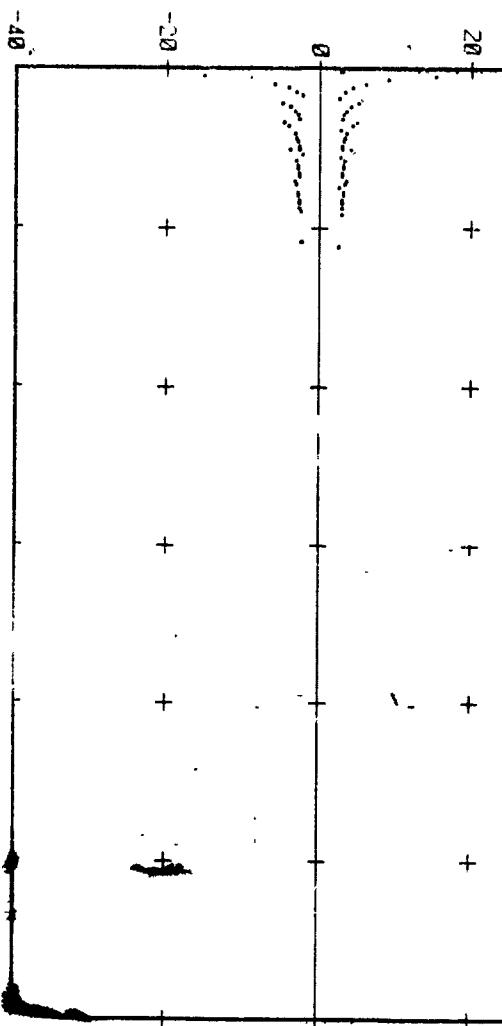
1450 MS 1500 1550

LRAPP

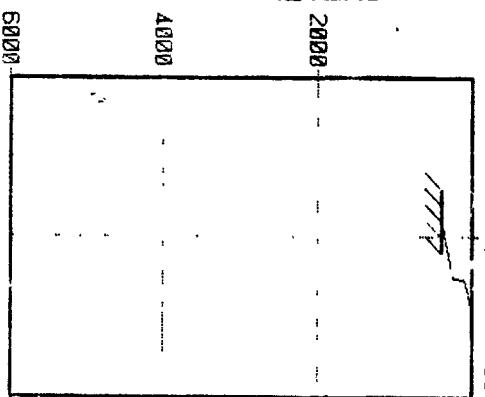
DB LOSS



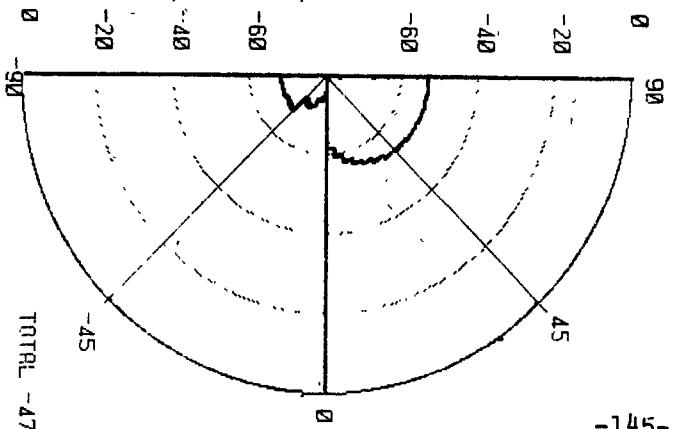
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



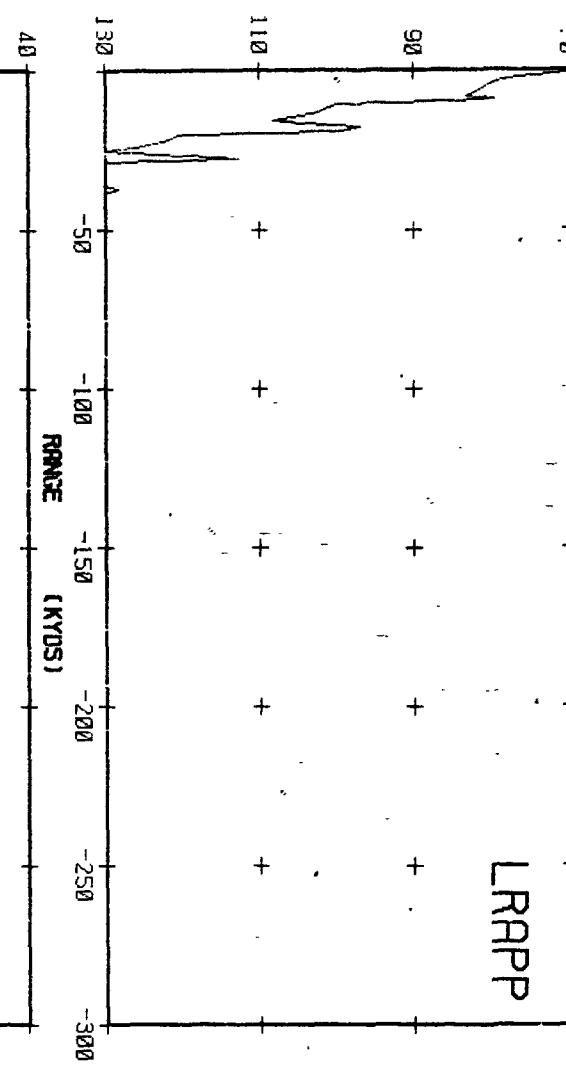
AREA 5 WINTER

S 50 R 62 F 2000

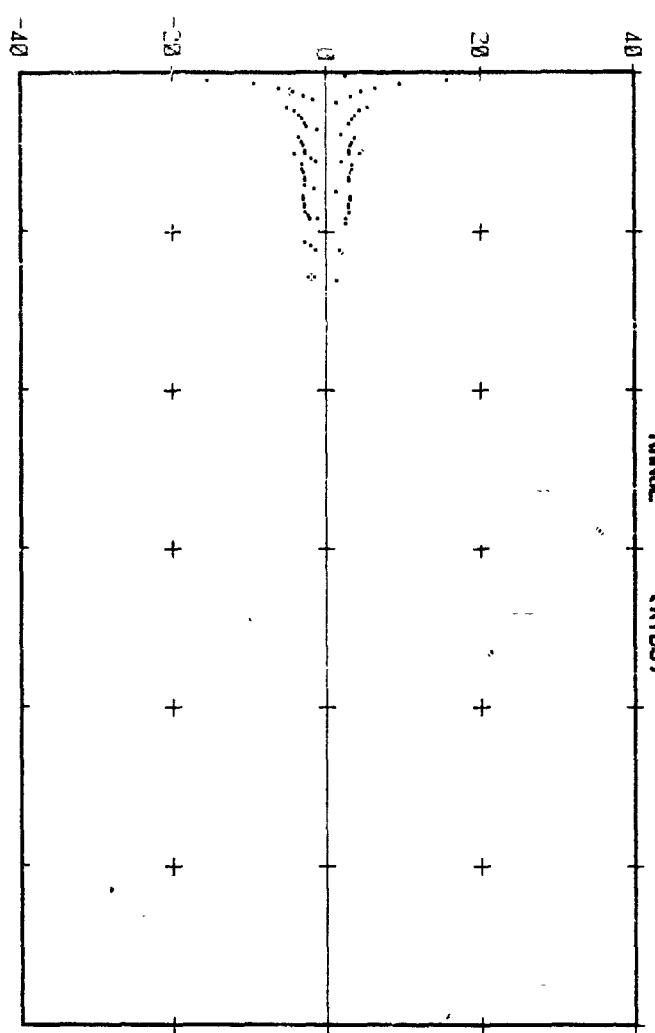
1450 M/S 1500 1550

L RAPP

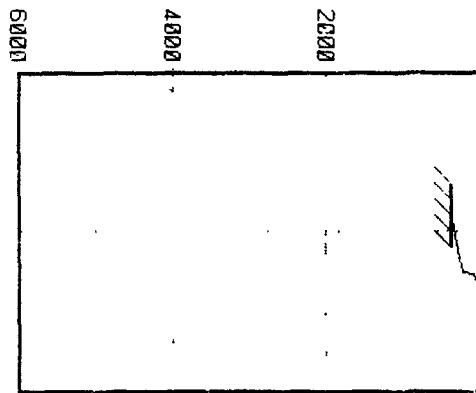
DB LOSS



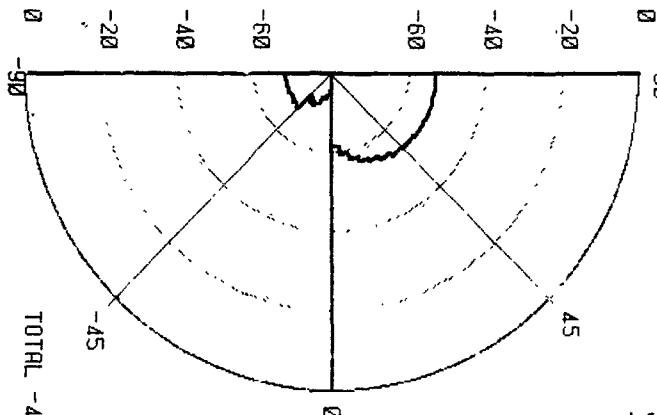
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



70

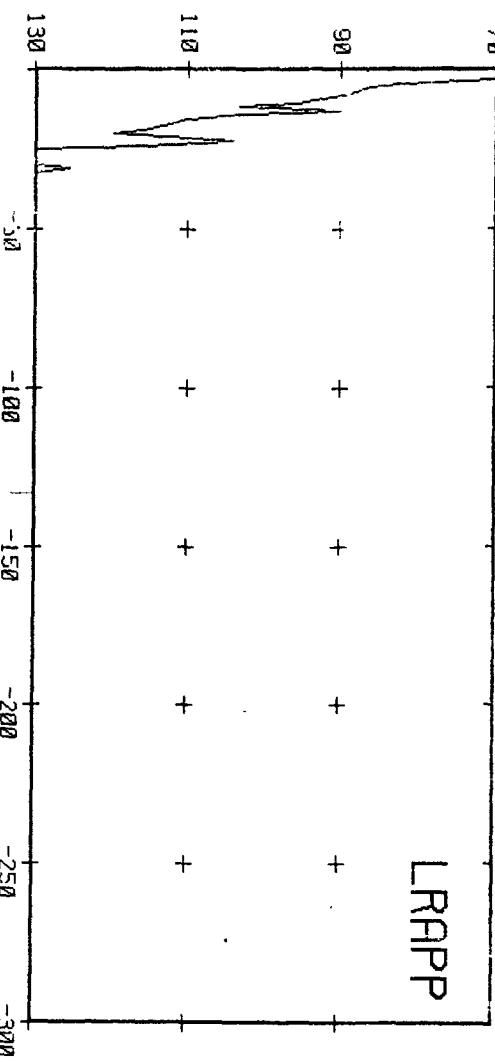
AREA 5 WINTER

S 1020 R 60 F 200P

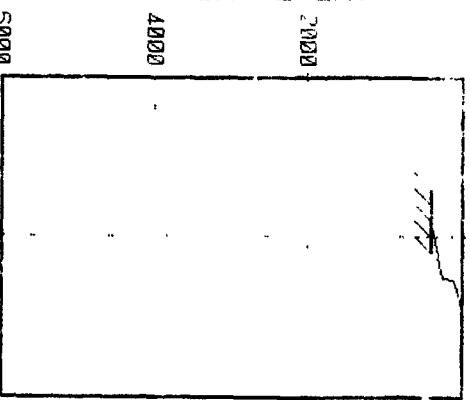
1450 1470 1500 1550

LRAPP

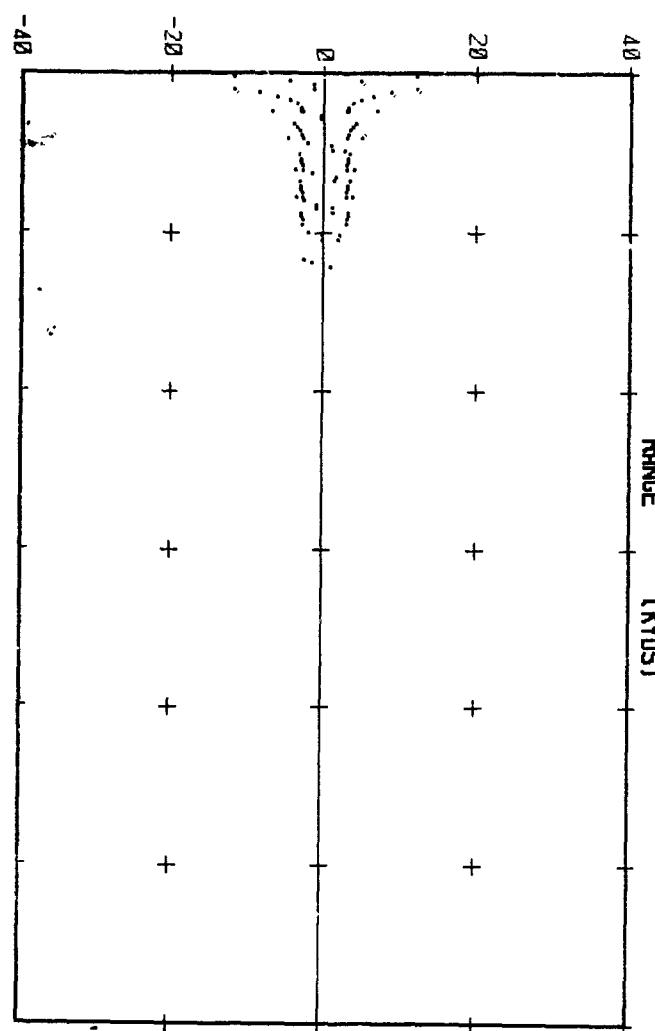
DB LOSS



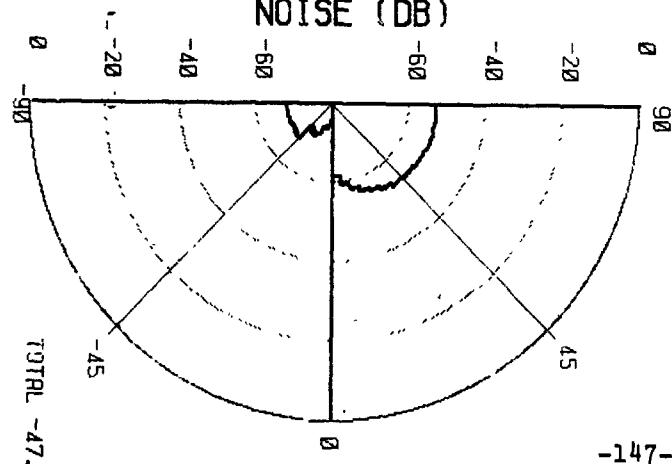
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



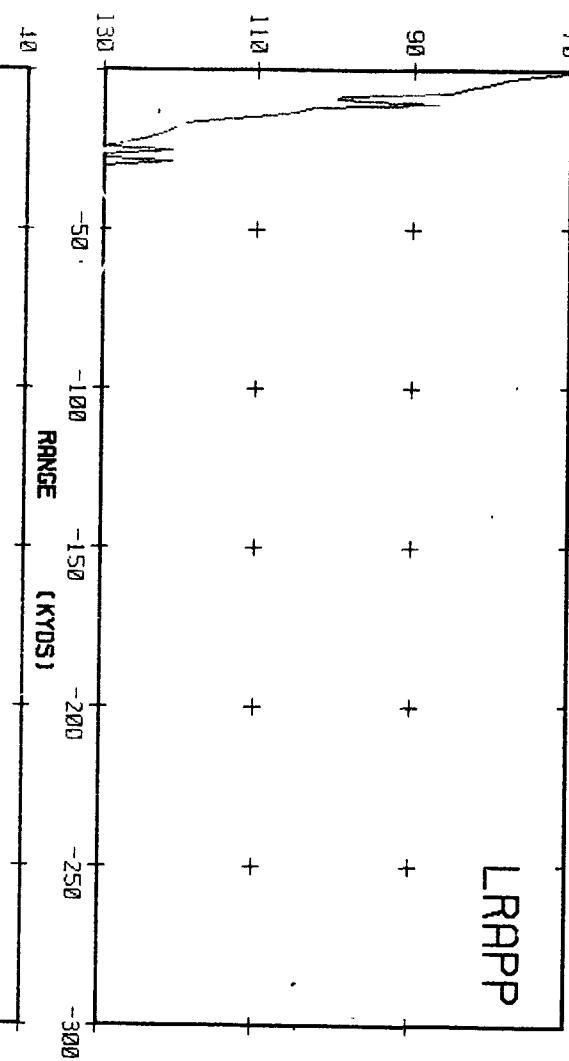
AREA 5 WINTER

S 20 R 300 F 2000

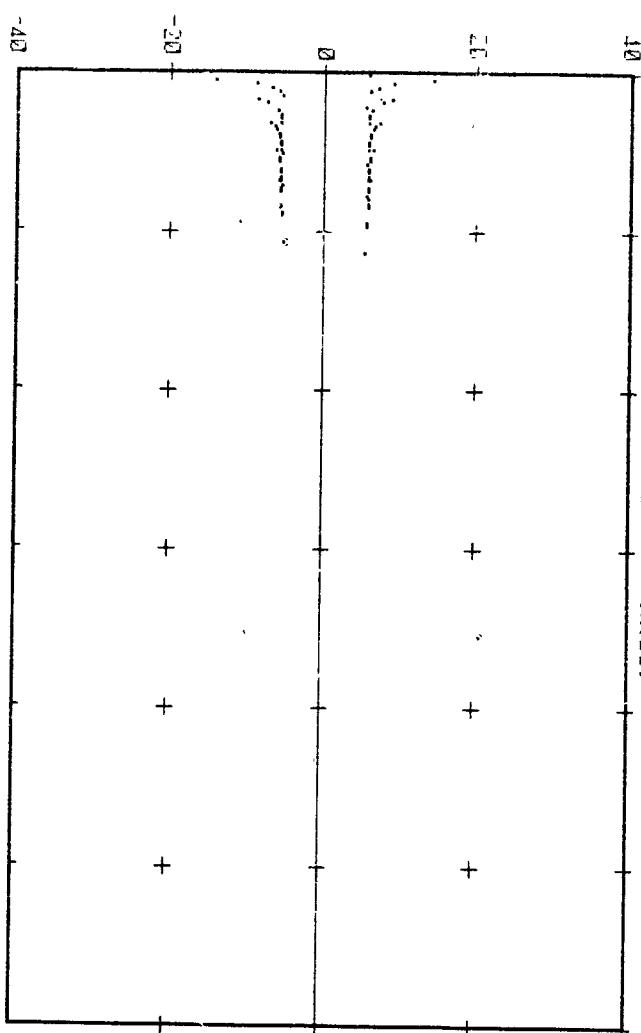
1450 M/S 1500 1550

L RAPP

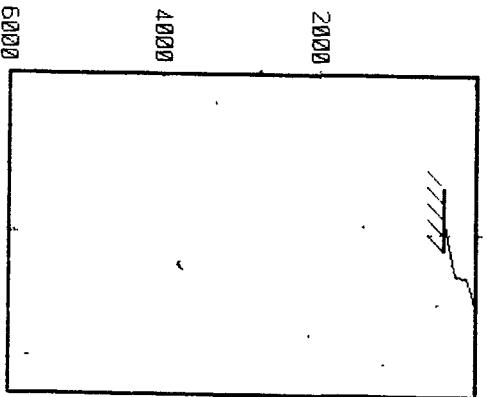
DB LOSS



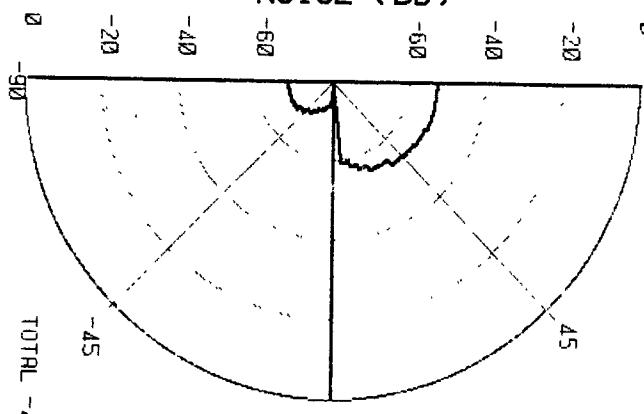
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -47.4 DB

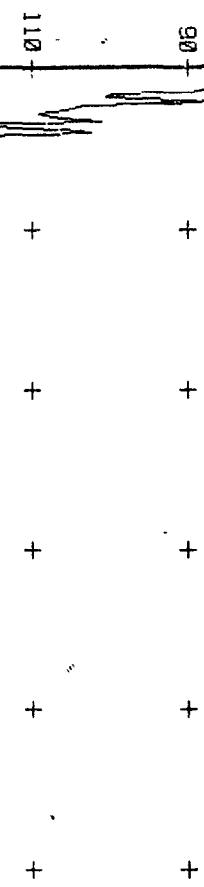
PRED 5 WINTER

S 50 R 300 F 2000

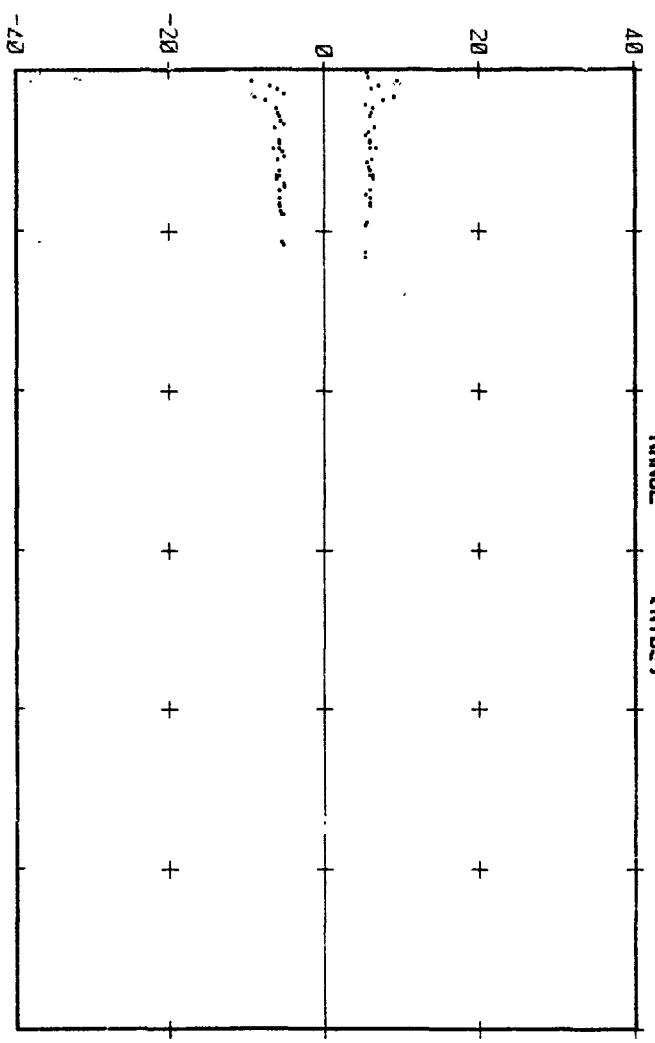
1450 M/S 1500 1550

L RAPP

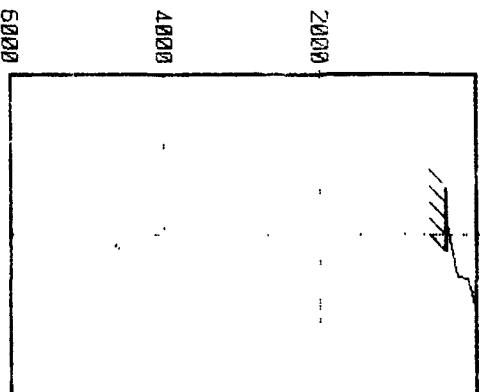
DB LOSS



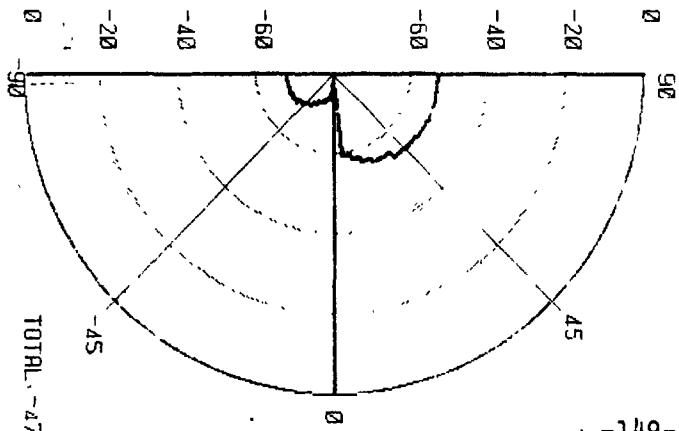
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



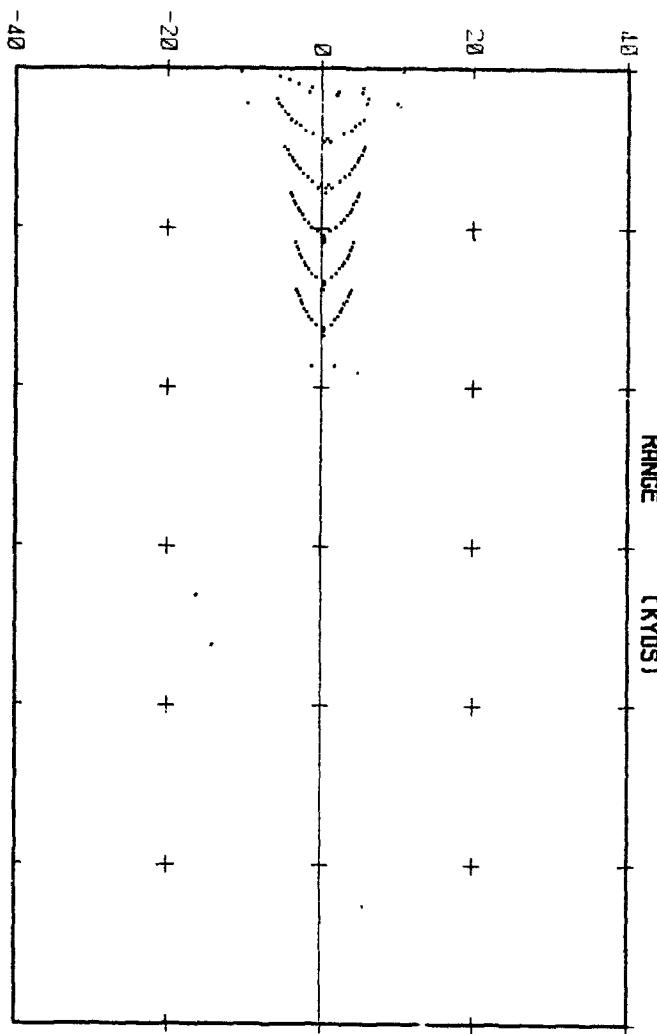
TOTAL, -47.1 DB

AREA 5 WINTER

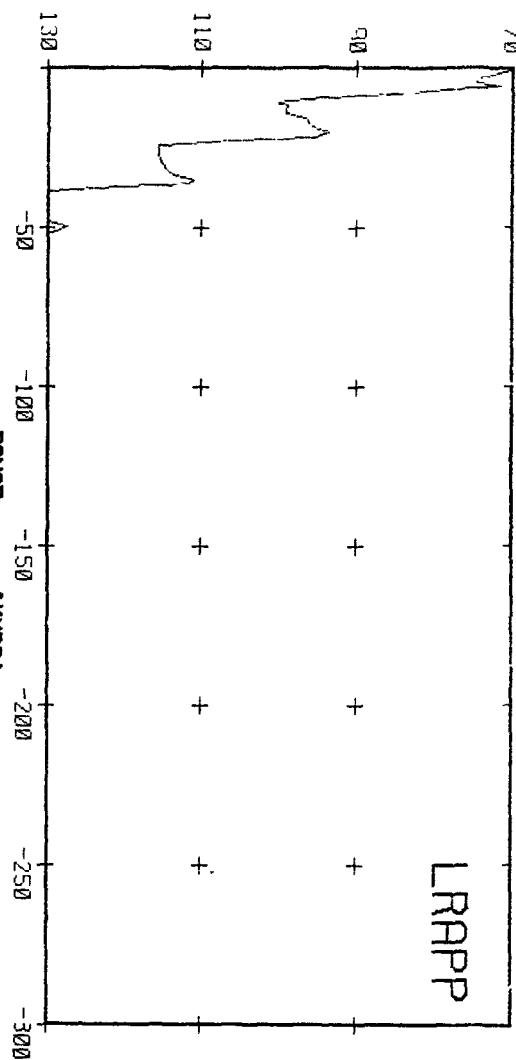
S 1820 R 300 F 2063

1450 11/5 1500 1550

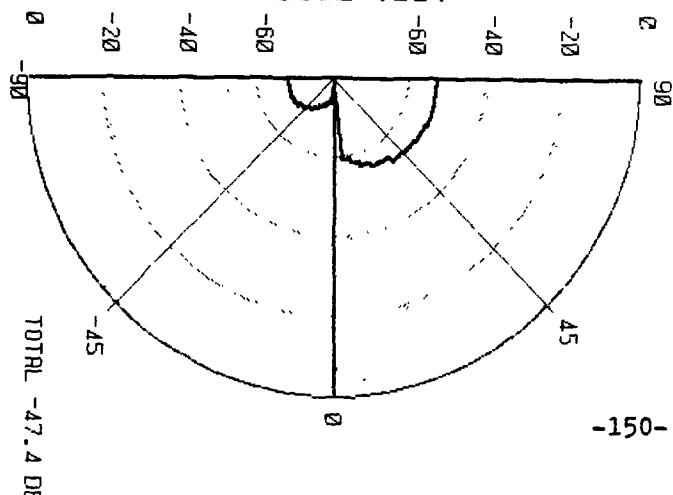
ARRIVAL ANGLE



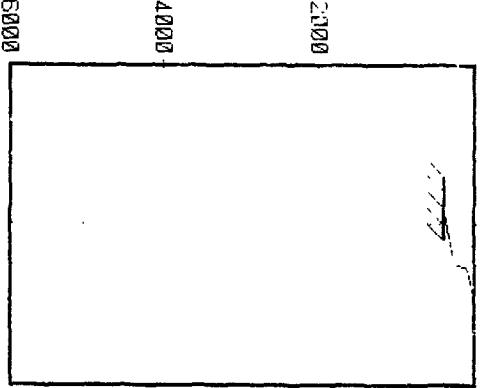
DB LOSS



NOISE (DB)



DEPTH IN METERS



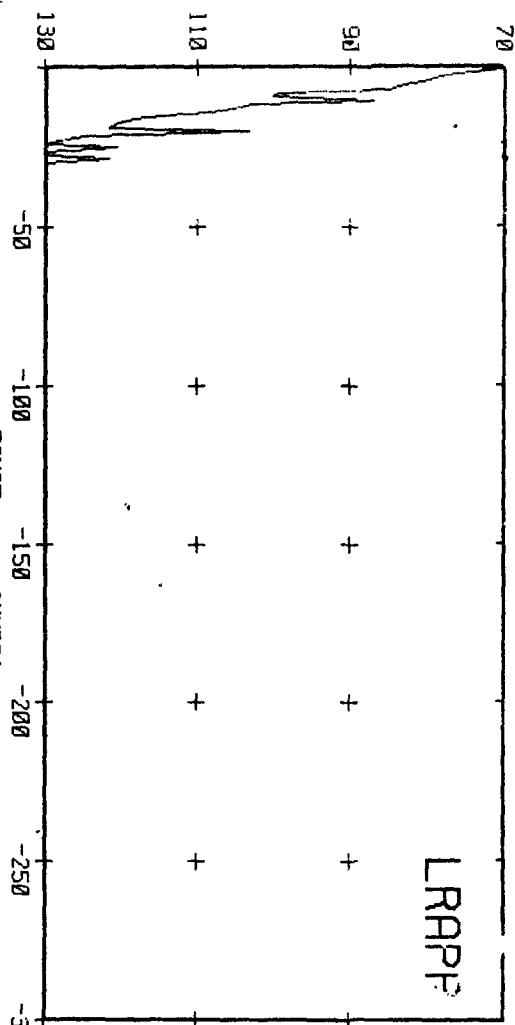
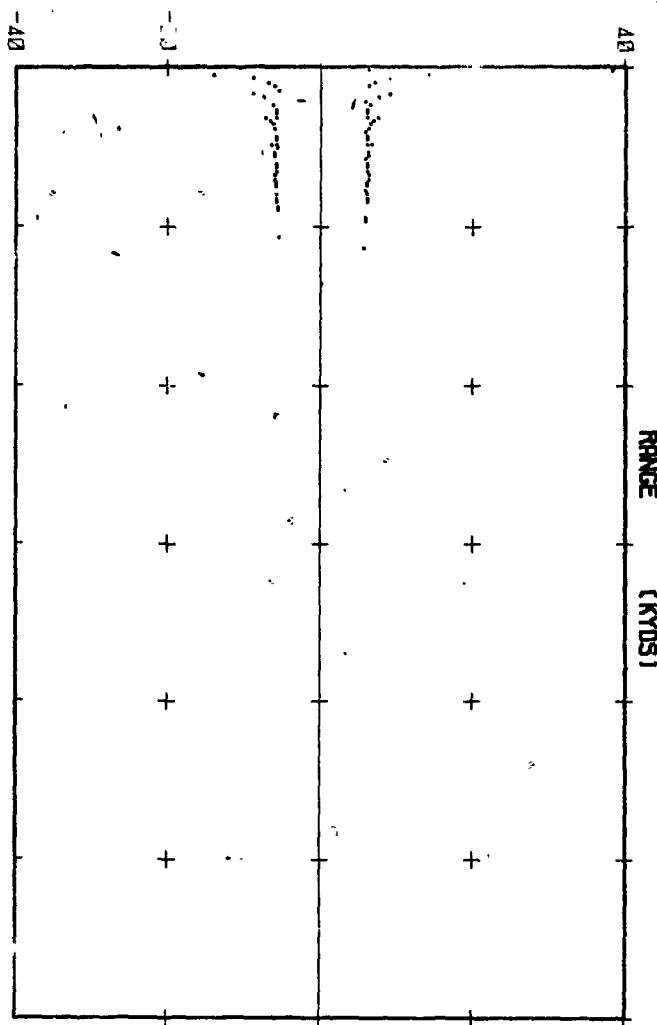


三

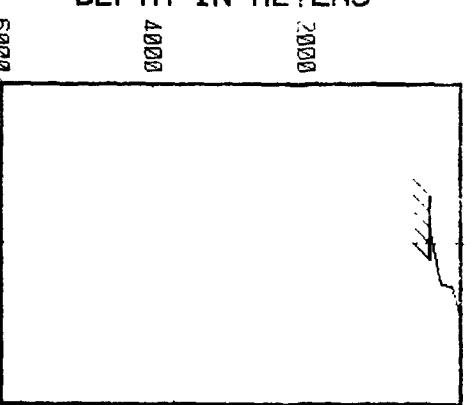
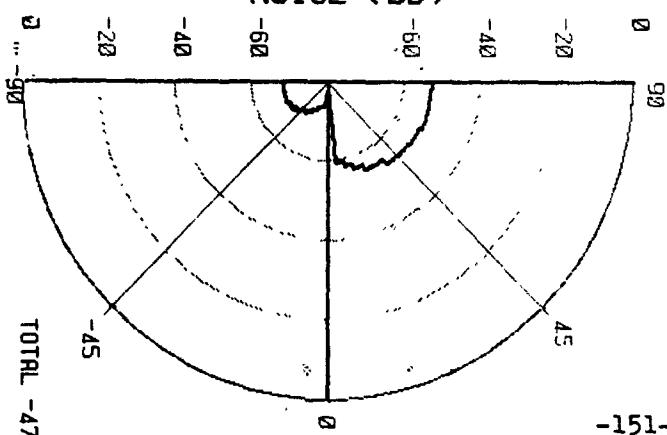
AKER 5 WINTER

5 28 R 328 F 2000

1450 M/S 1500 1550



NOISE (DB)

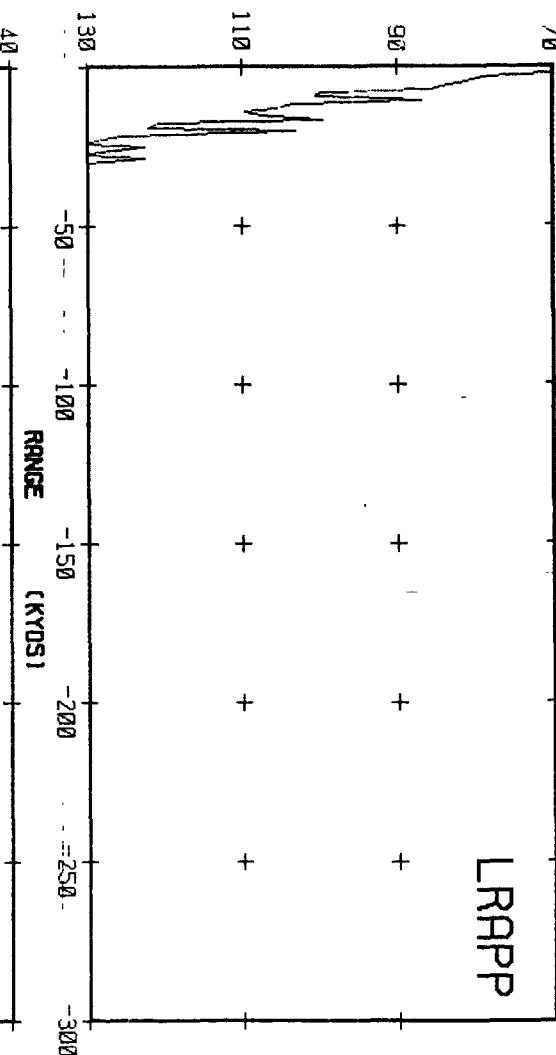


AREA 5 WINTER S 50 R 328 F 2000

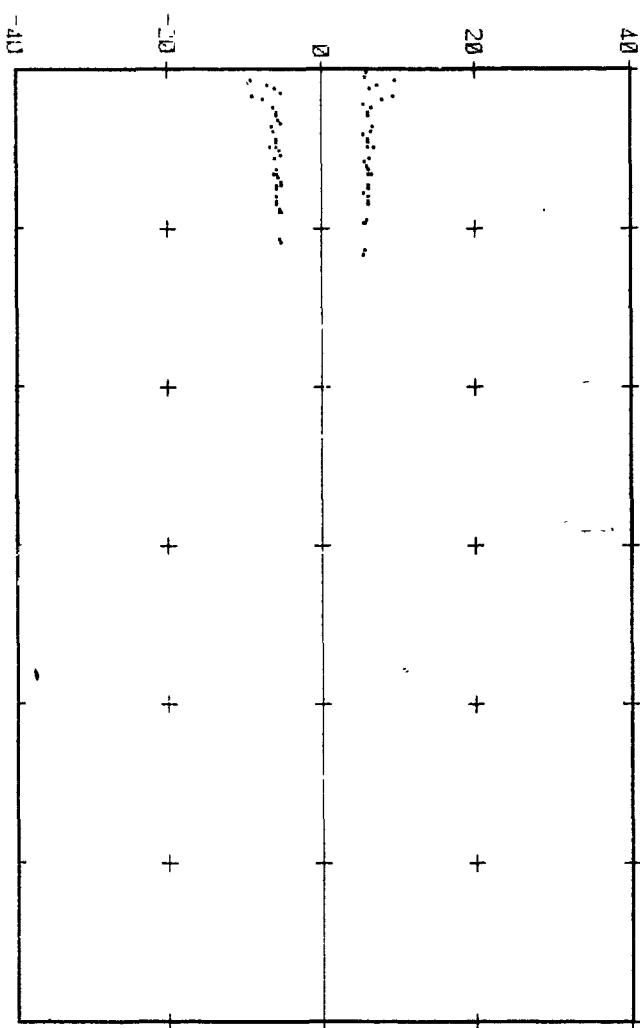
1450 M/S 1500 1550

LRAAPP

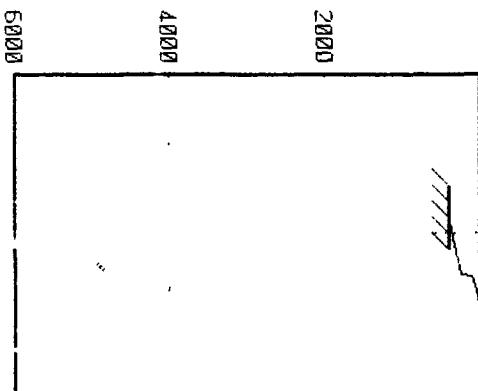
DB LOSS



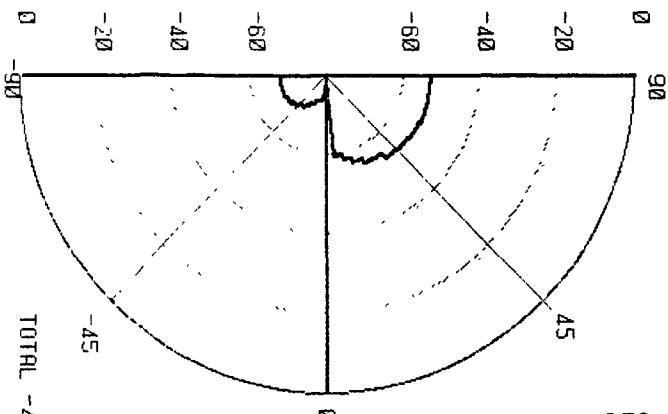
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



70

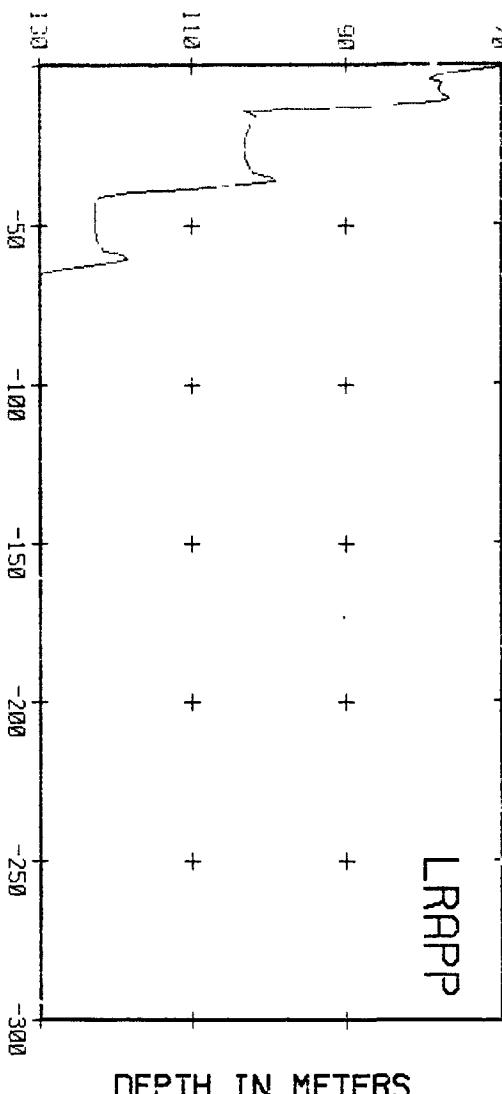
AKER 5 WINTER

S 1020 R 328 F 2000

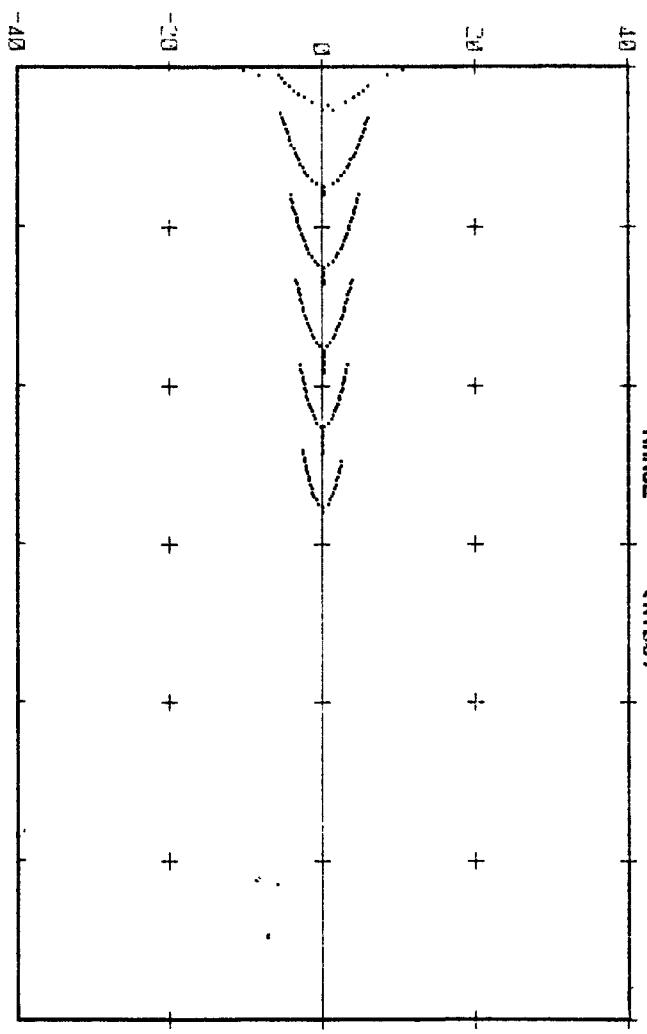
1450 M/S 1500 1550

LRAPP

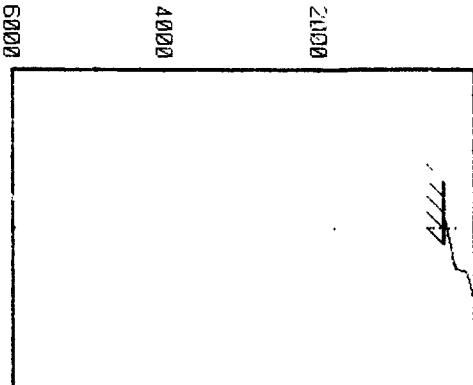
DB LOSS



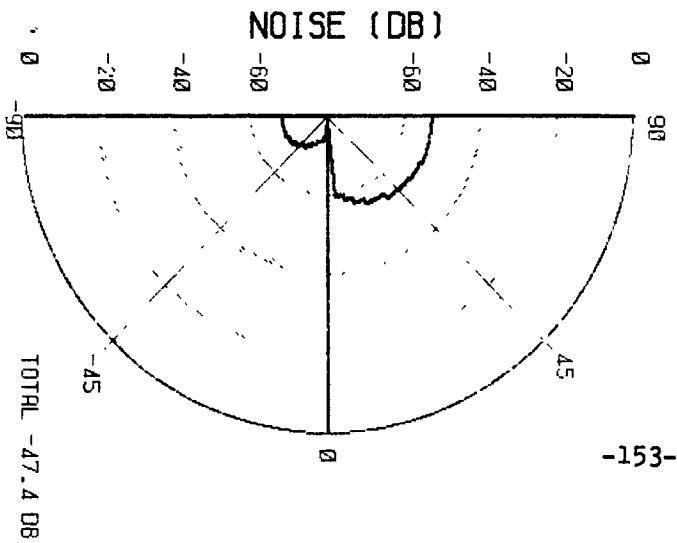
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



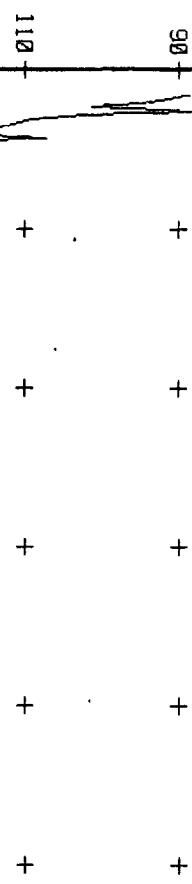
AREA 5 WINTER

S 20 R 920 F 2000

1450 M/S 1500 1550

L RAPP

DB LOSS



130
110
90
40
-50 -100 -150 -200 -250 -300

RANGE (KYDS)

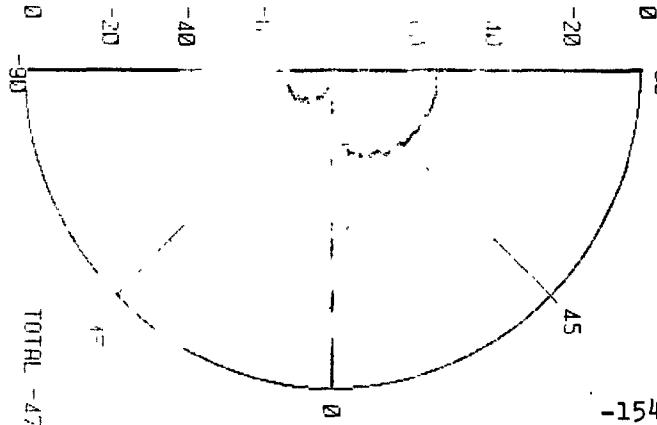
DEPTH IN METERS

2000
4000
6000

0
90
45
40
-20

-154-

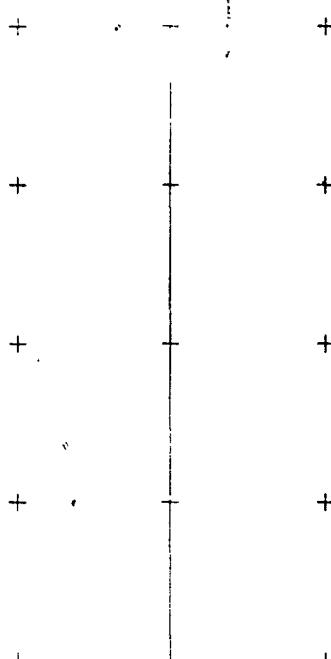
NOISE (DB)



TOTAL -47.5 DB

-40

ARRIVAL AND LOSS



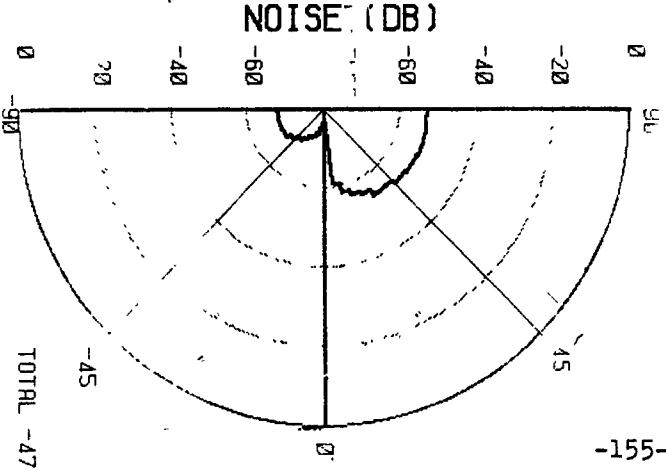
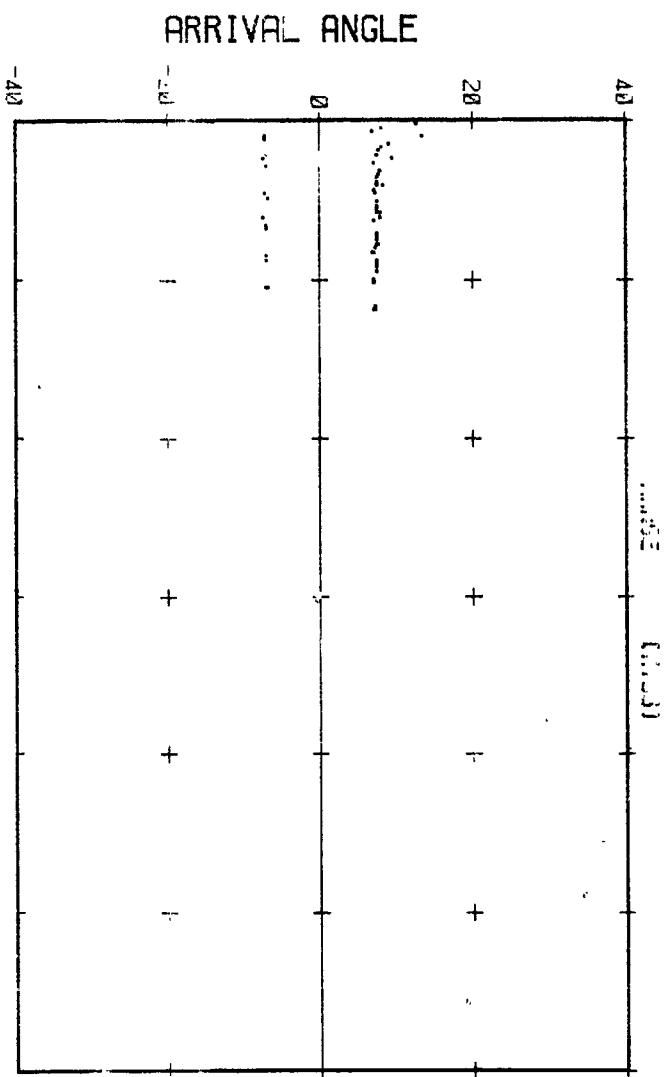
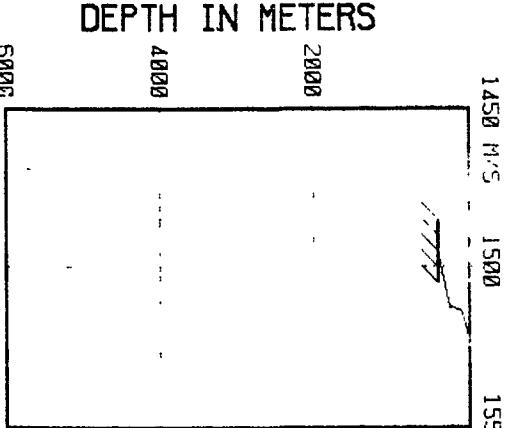
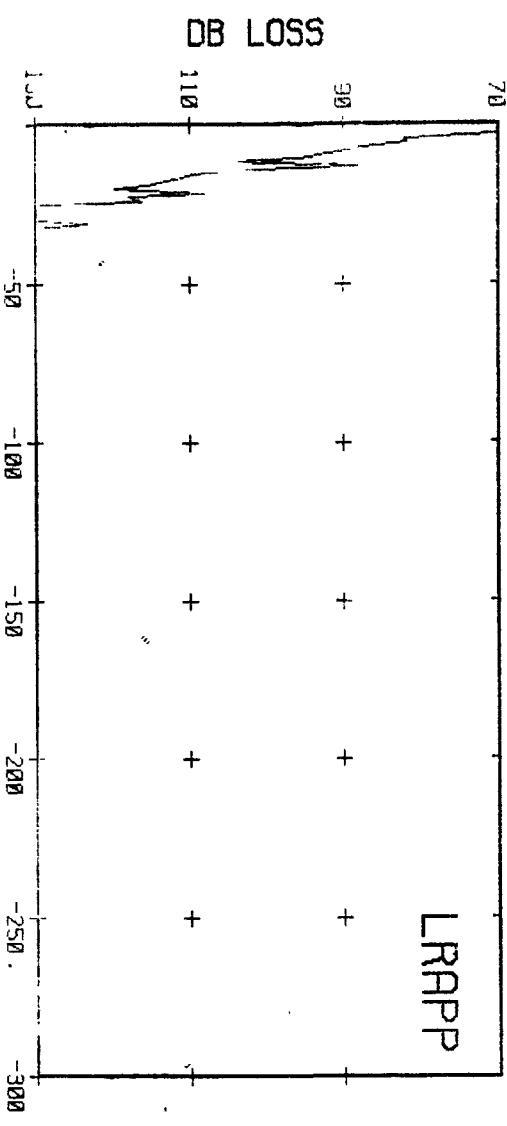
130
110
90
40
-50 -100 -150 -200 -250 -300

RANGE (KYDS)

AREA 5 WINTER

S 50 R 920 F 2000

1450 M.S. 1500 1550



AREA 5 WINTER

S 1020 R 920 F 2000

1450 M/S 1500 1550

LRAPP

DB LOSS

70
90
110
30
50
-50
-100
-150
-200
-250
-300

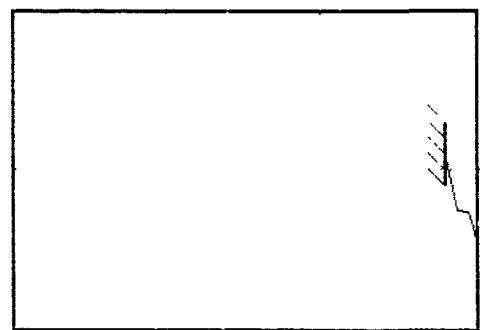
ARRIVAL ANGLE

40
20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
-200
-220
-240
-260
-280
-300

RANGE (KMS)

DEPTH IN METERS

2000
4000
6000

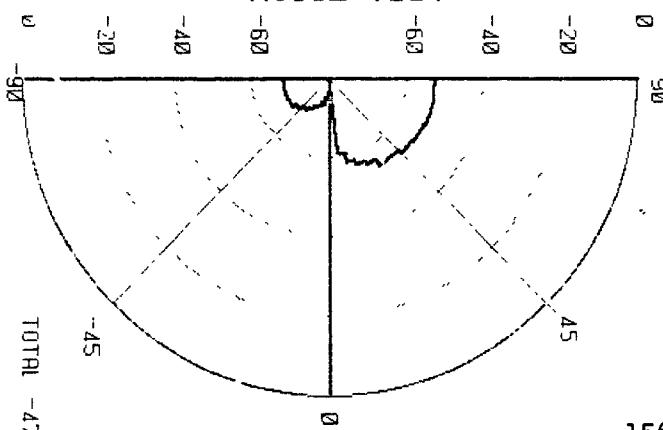


NOISE (DB)

0
-20
-40
-60

45

0



-10

-20
-30
-40
-50
-60
-70
-80
-90

TOTAL -47.5 DB

70

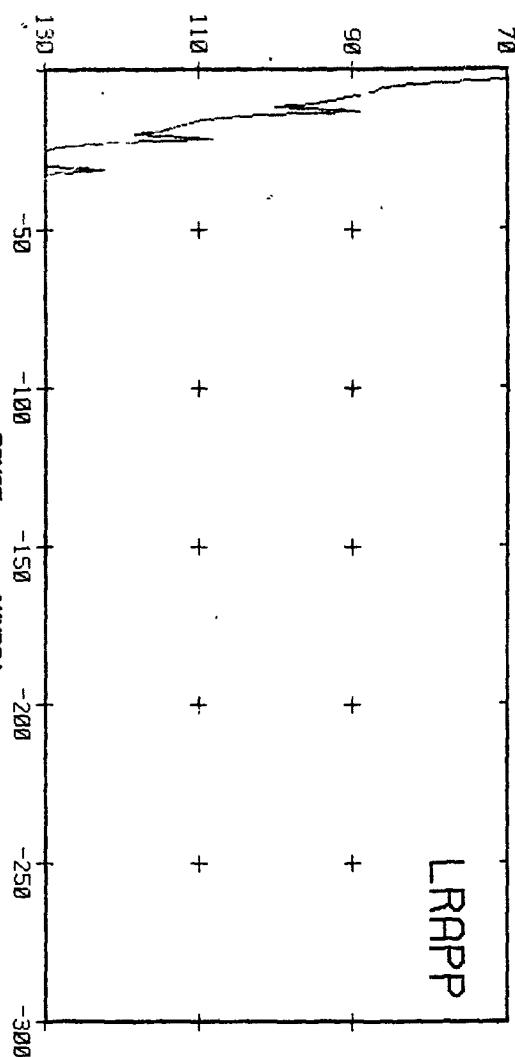
AREA 5 WINTER

S 20 R 1650 F 2300

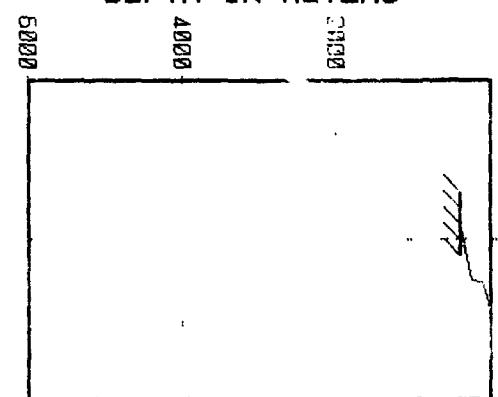
1450 M/S 1500 1550

LRAPP

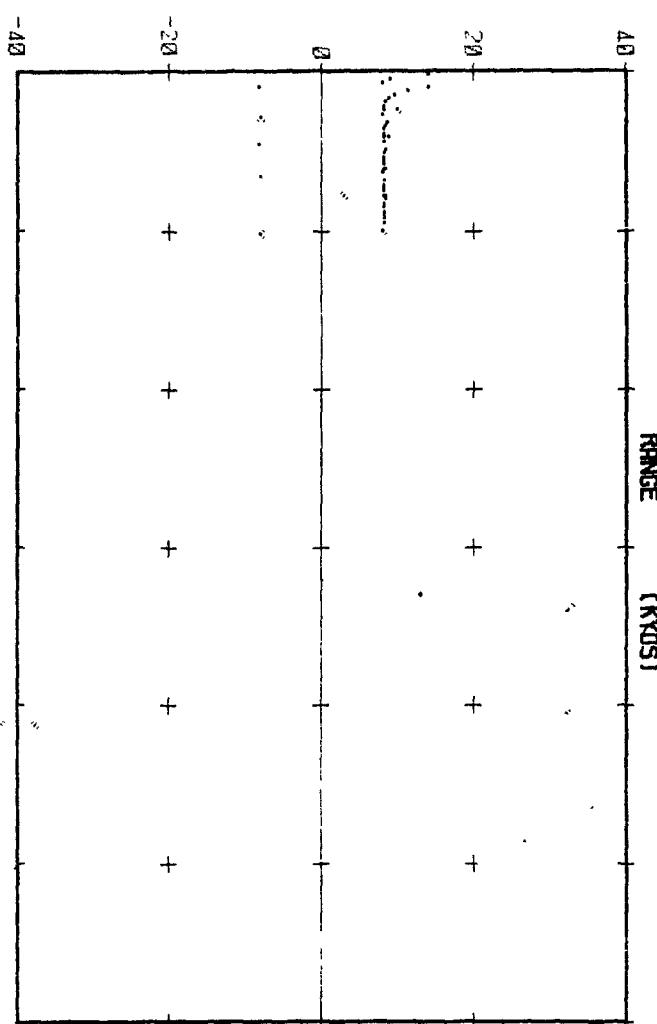
DB LOSS



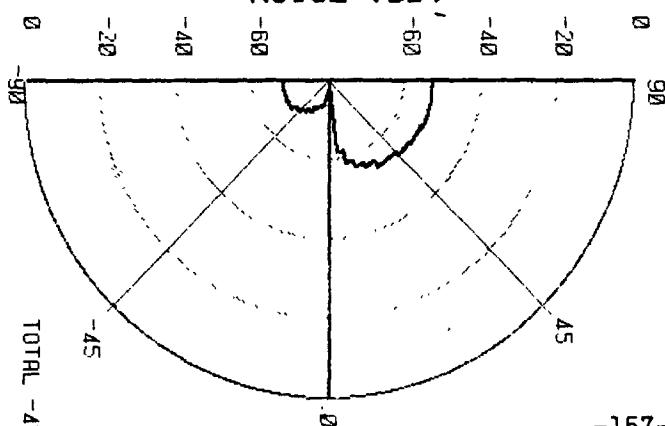
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



TOTAL -47.6 DB

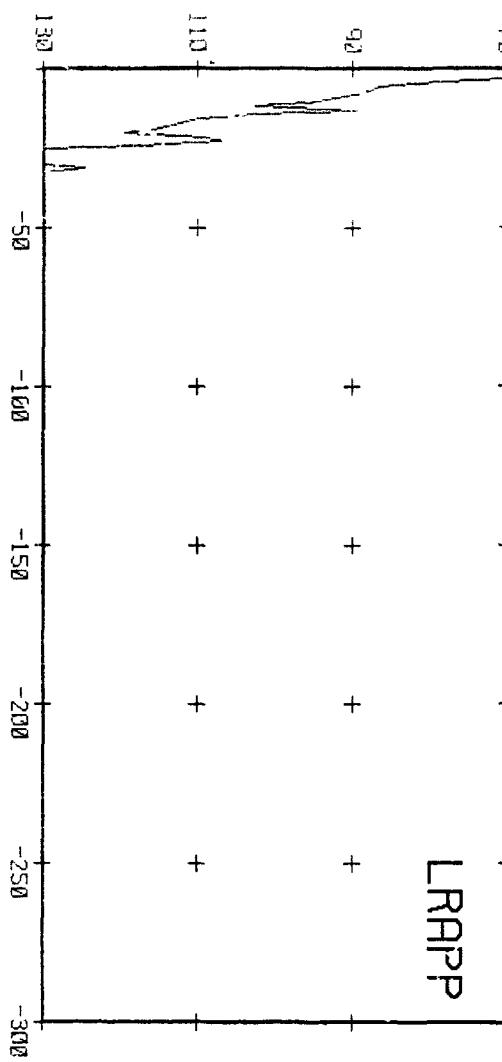
AREA 5 WINTER

S 50 R 1000 F 2000

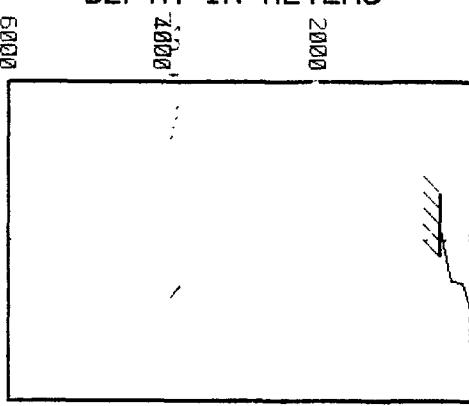
1450 M/S 1500 1550

LRAPP

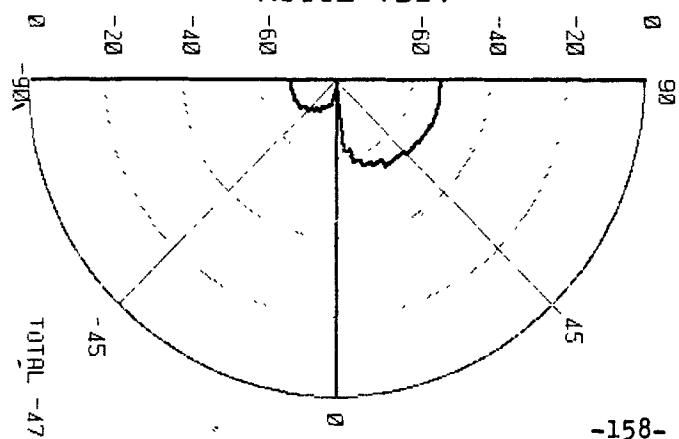
DB LOSS



DEPTH IN METERS



NOISE (DB)



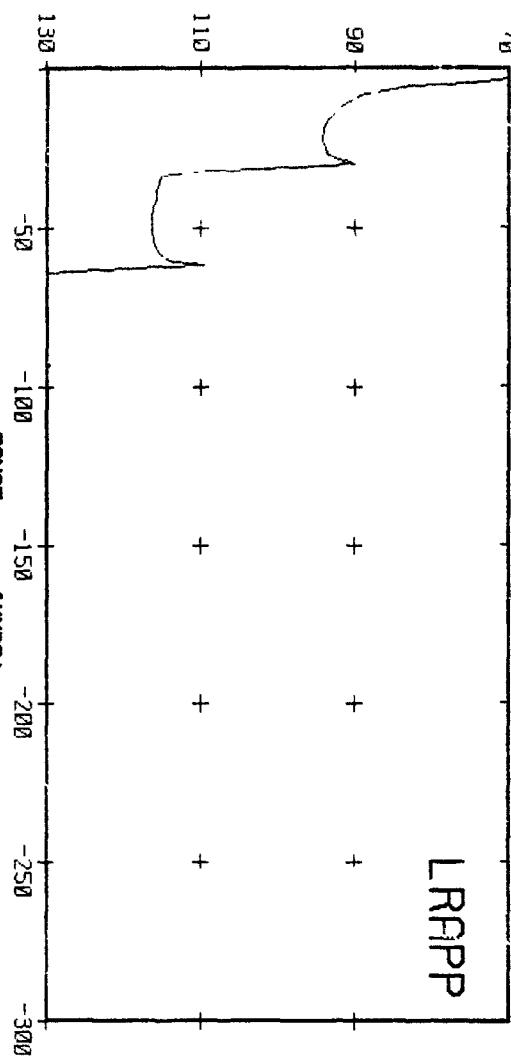
AREA 5 WINTER

S 1020 R 1000 F 2222

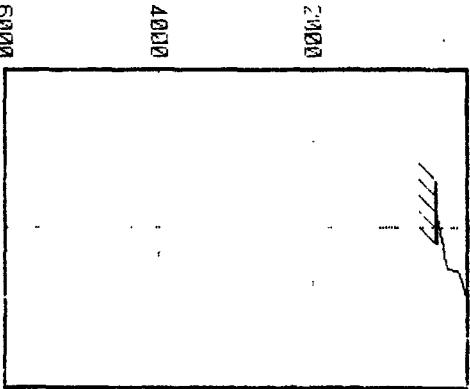
1450 M/S 1500 1550

LRRAPP

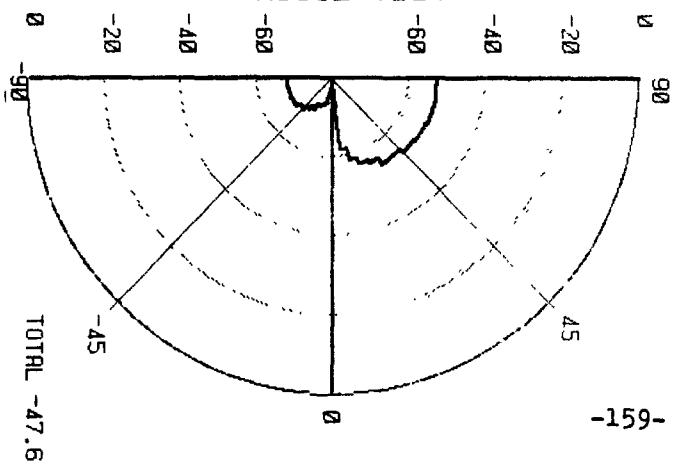
DB LOSS



DEPTH IN METERS

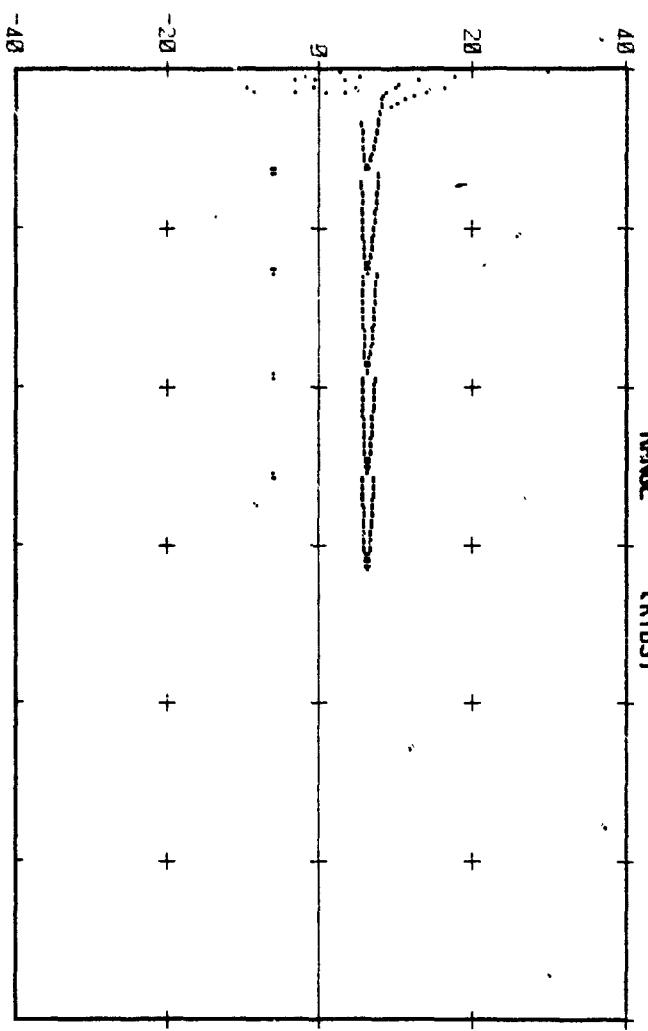


NOISE (DB)



-159-

ARRIVAL ANGLE



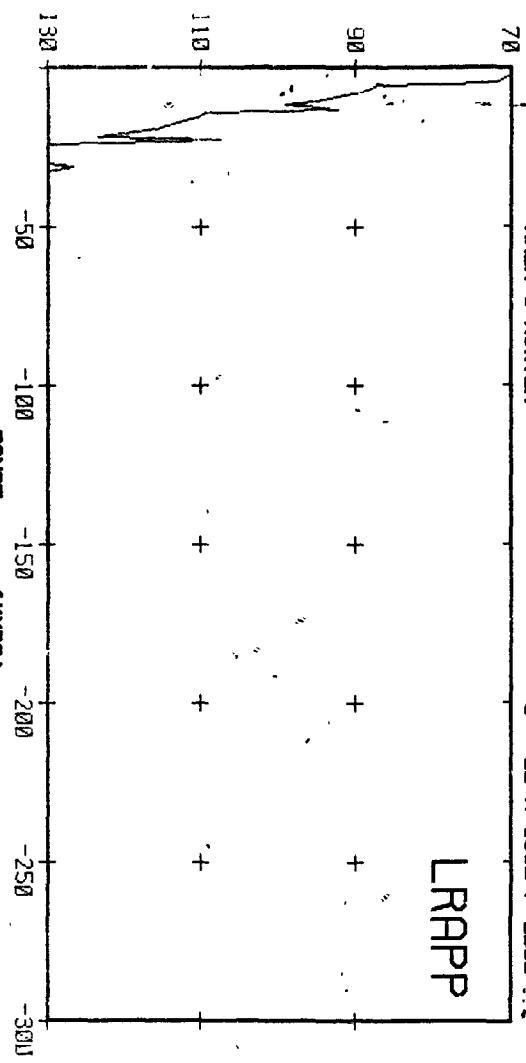
AKER 5 WINTER

S 20 R 1312 F 2000

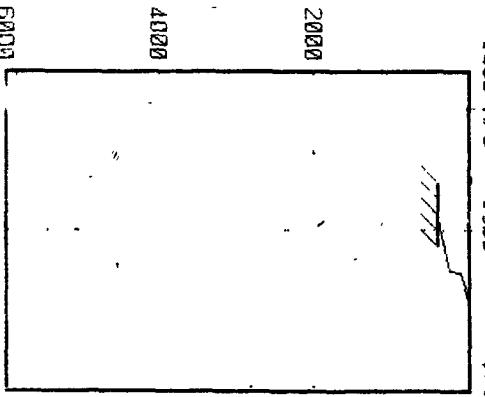
1450-M/S 1500 1550

LRAPP

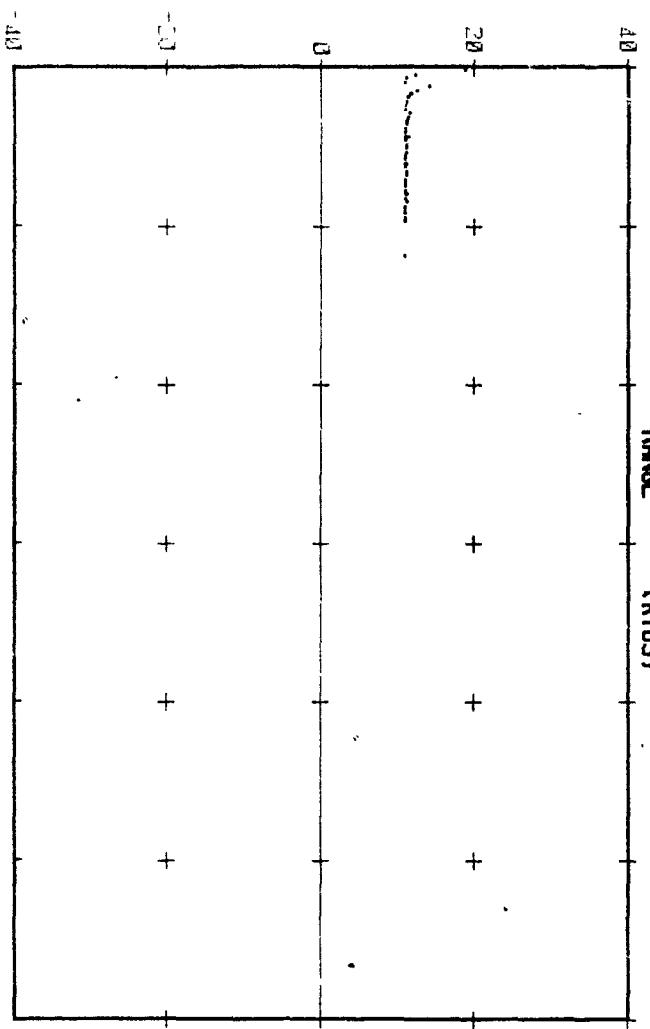
DB LOSS



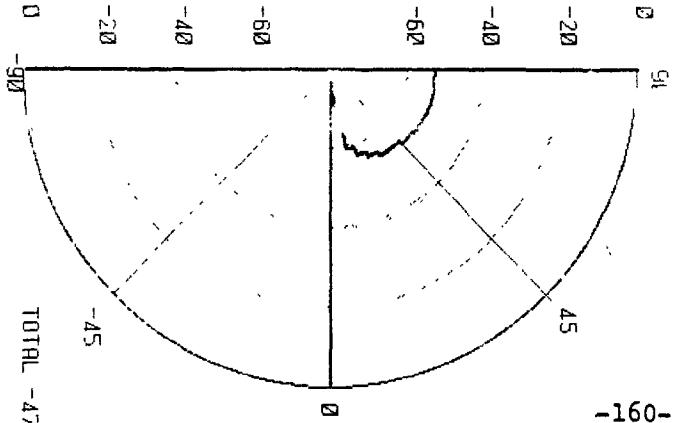
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



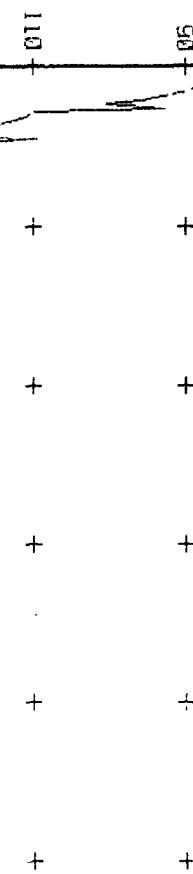
AREA 5 WINTER

S 53 R 1312 F 2000

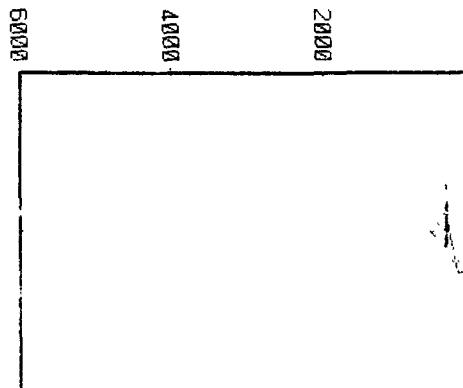
1450 M/S 1500 1550

LRAPP

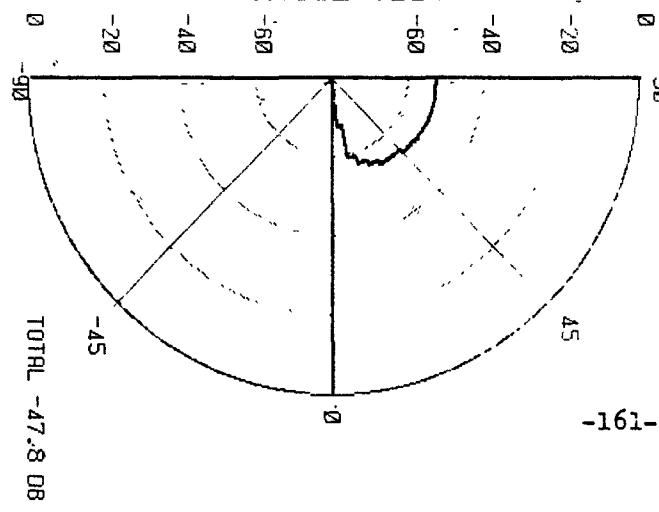
DB LOSS



DEPTH IN METERS



NOISE (DB)



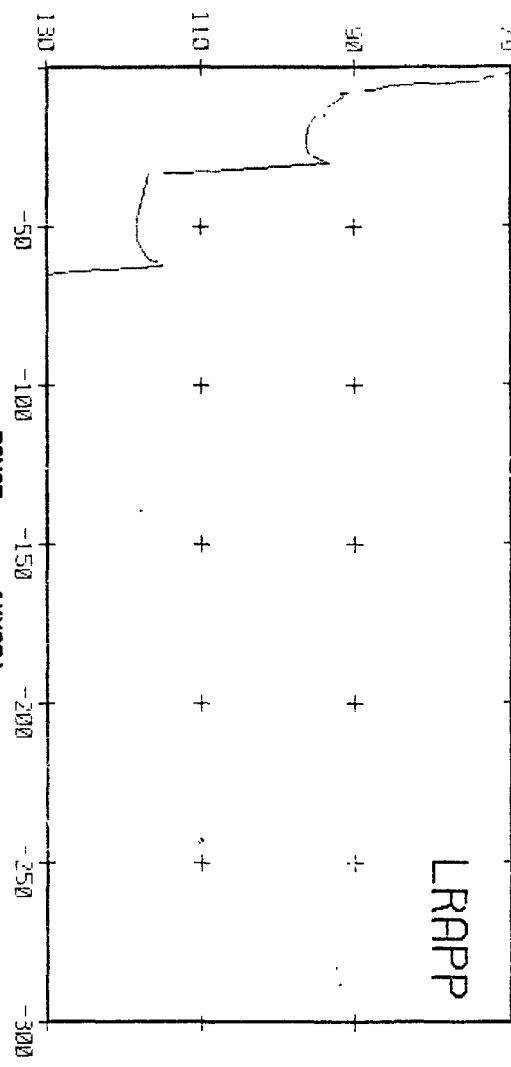
AREA 5 WINTER

S 1020 R 1312 F 2000

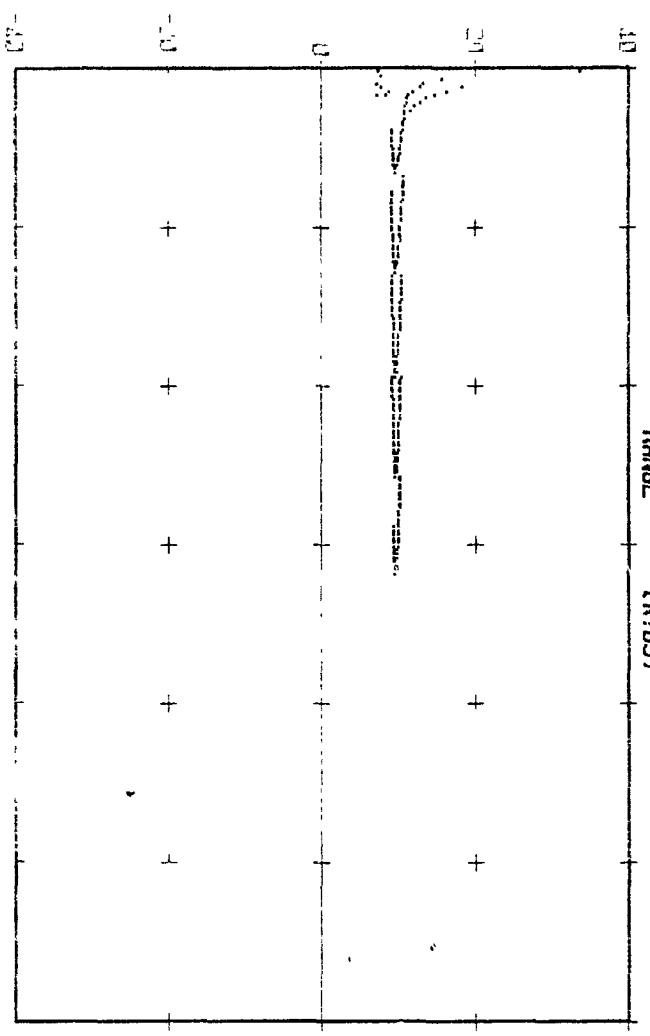
1450 145 1500 1550

LRAPP

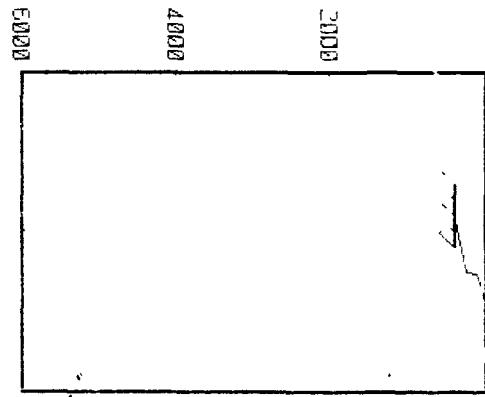
DB LOSS



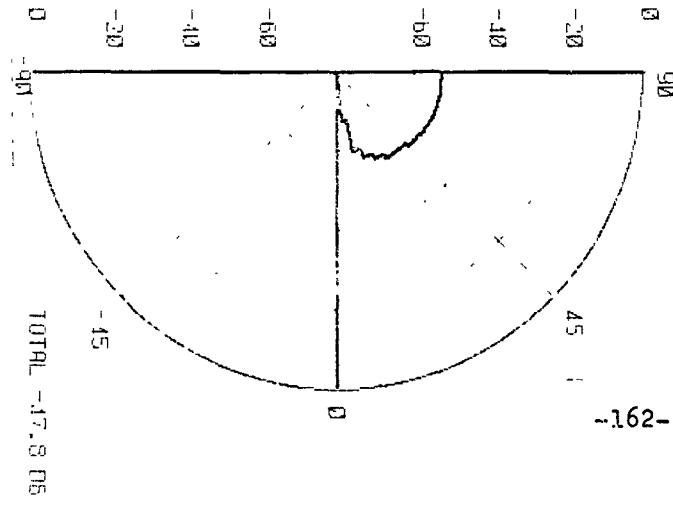
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



78

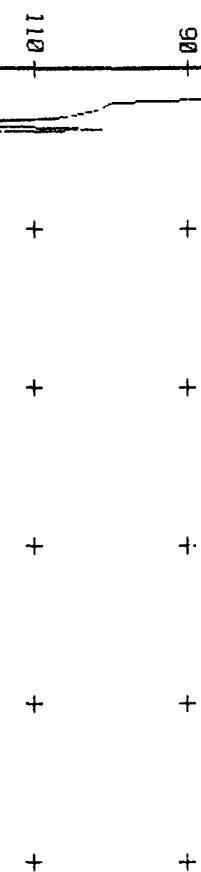
RER 5 WINTER

S 20 R 60 F 2500

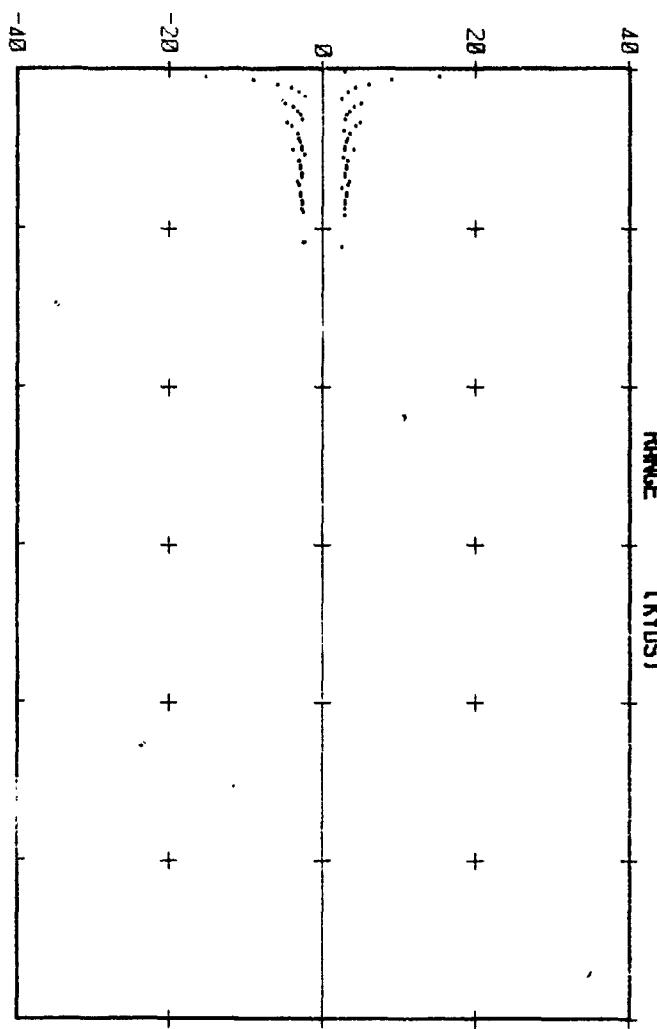
1450 M/S 1500 1550

LRAPP

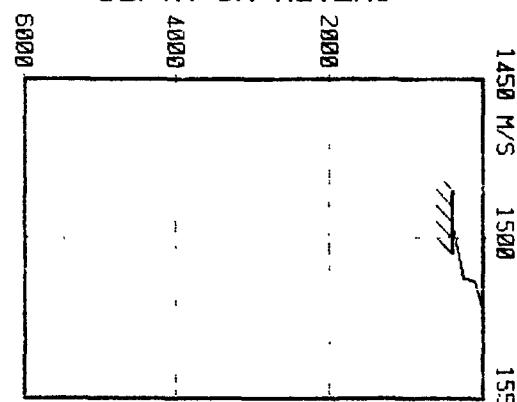
DB LOSS



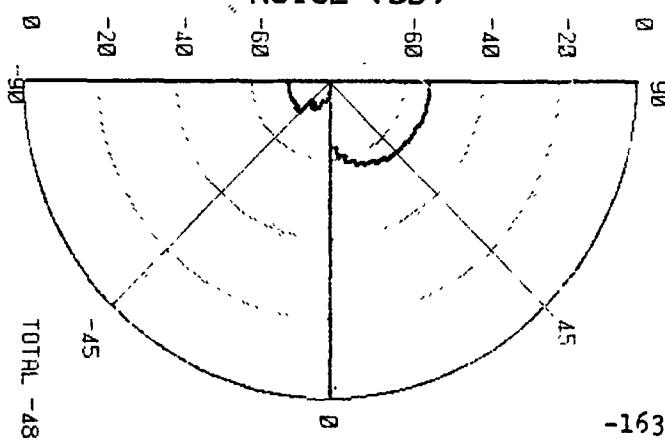
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)

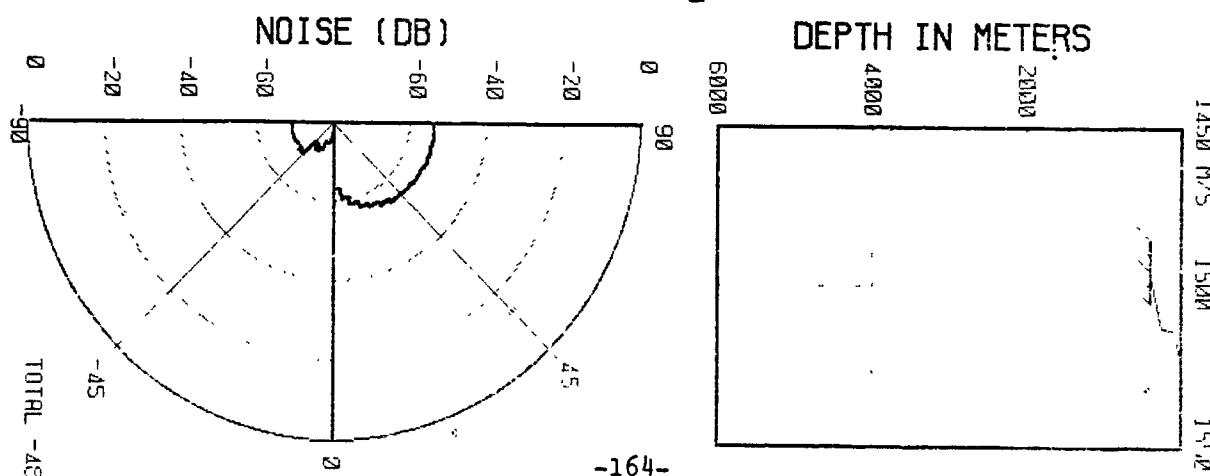
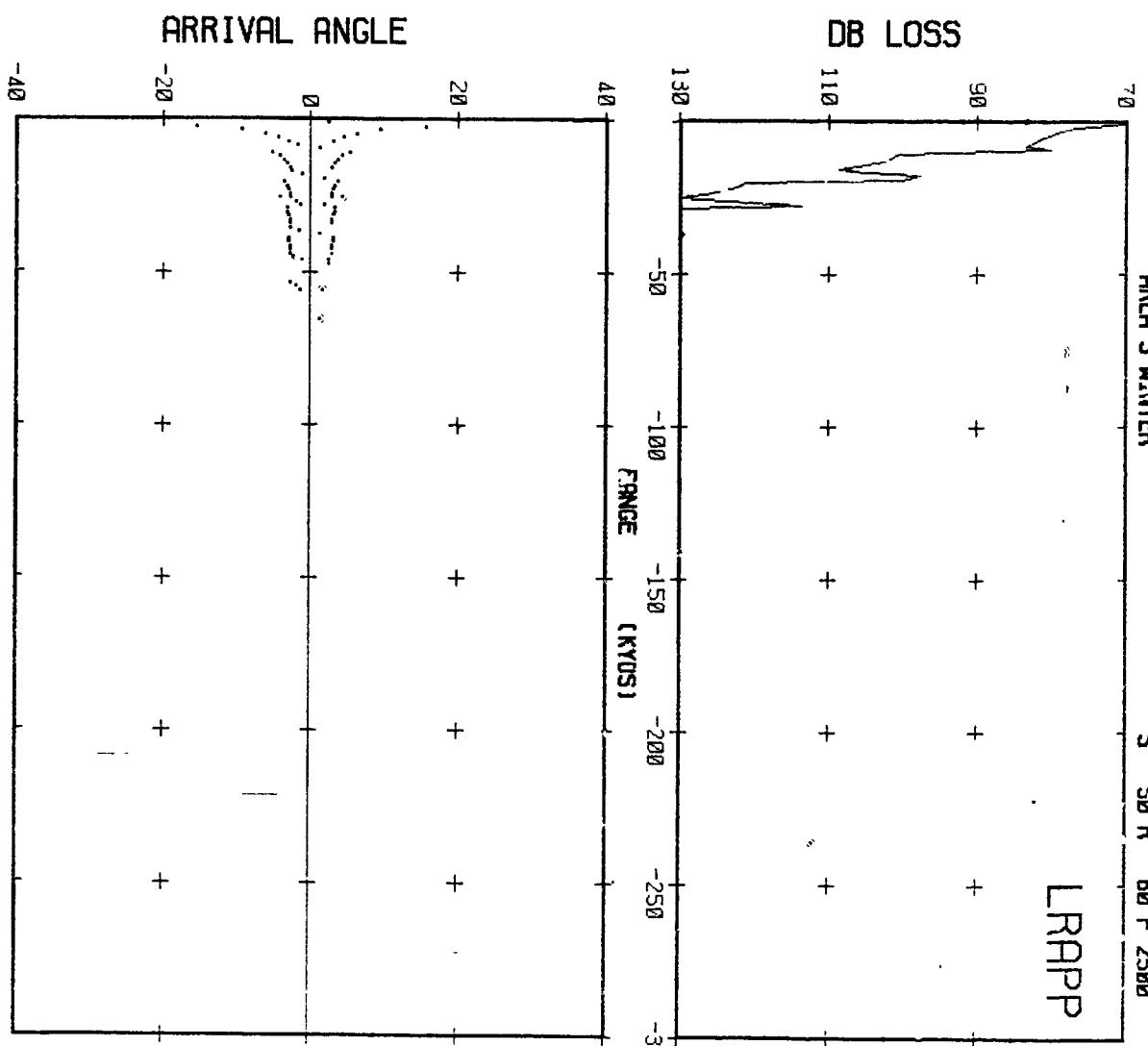


TOTAL -48.3 DB

AREA 5 WINTER

S 50 R 60 F 2580

1450 M/S 1500 1572



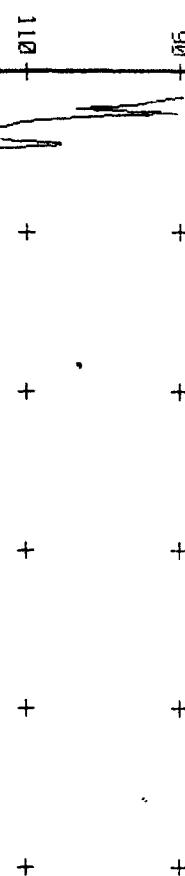
AKER 5 WINTER

S 1020 R 60 F 2500

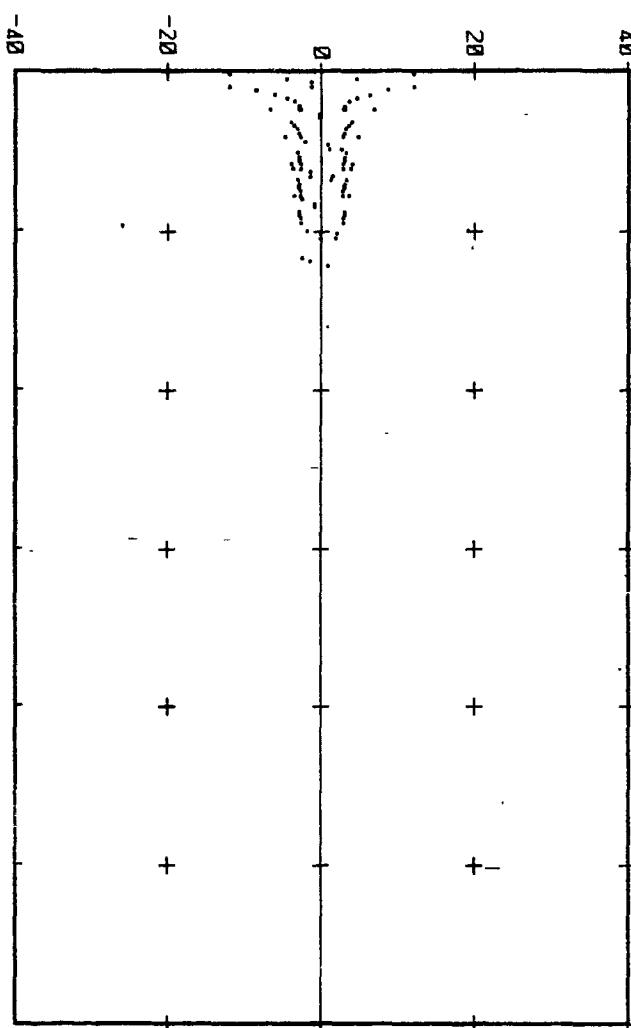
1450 M/S 1500 1550

L RAPP

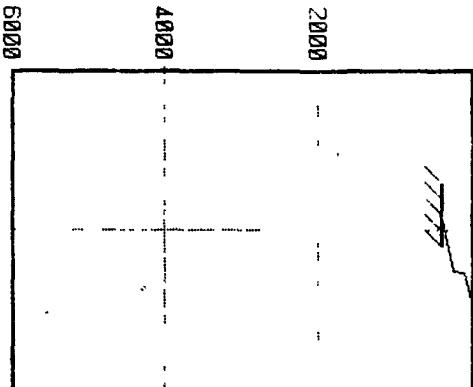
DB LOSS



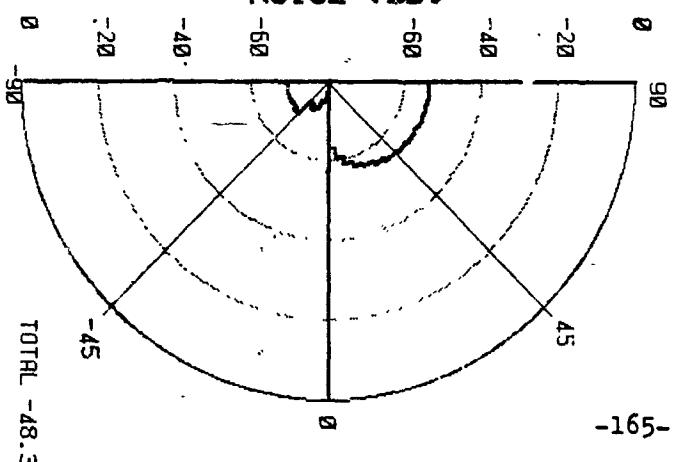
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



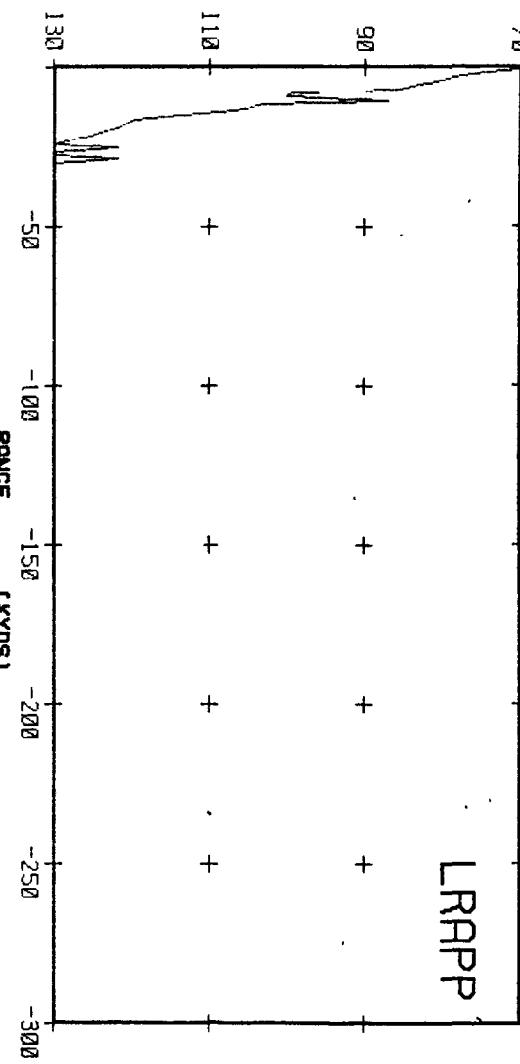
70

AREA 5 WINTER

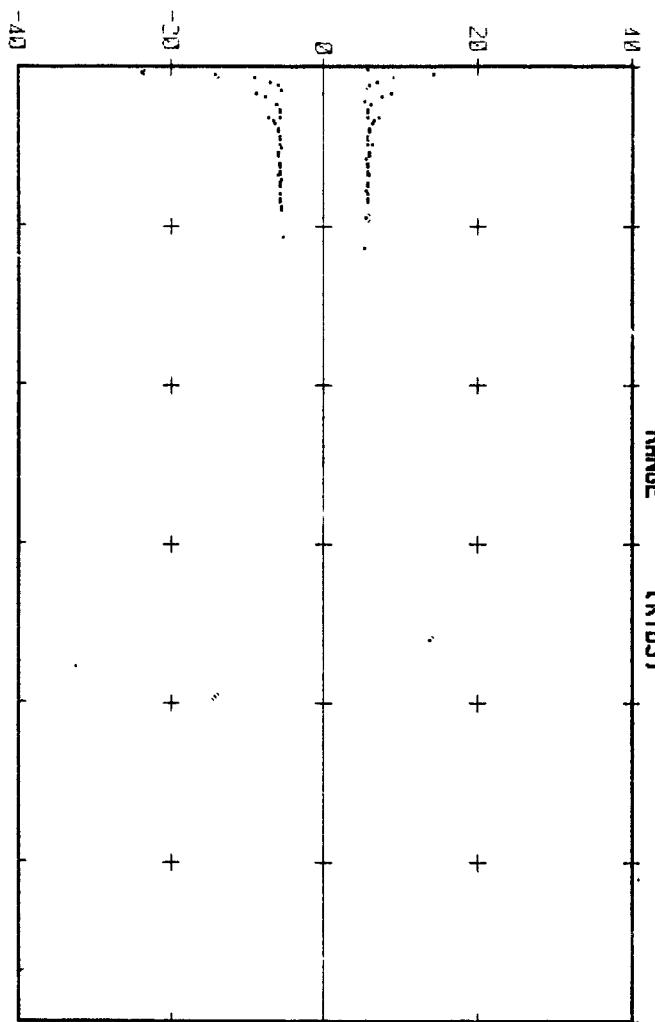
S 20 R 300 F 2500

1450 M/S 1500 1550

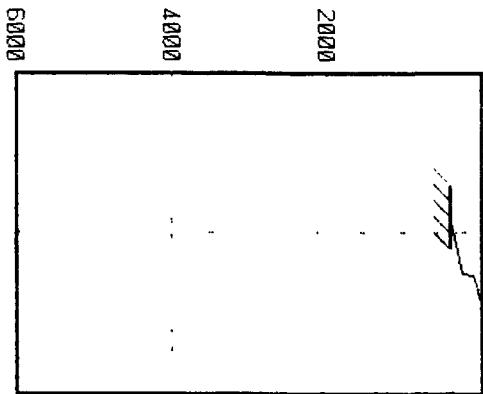
DB LOSS



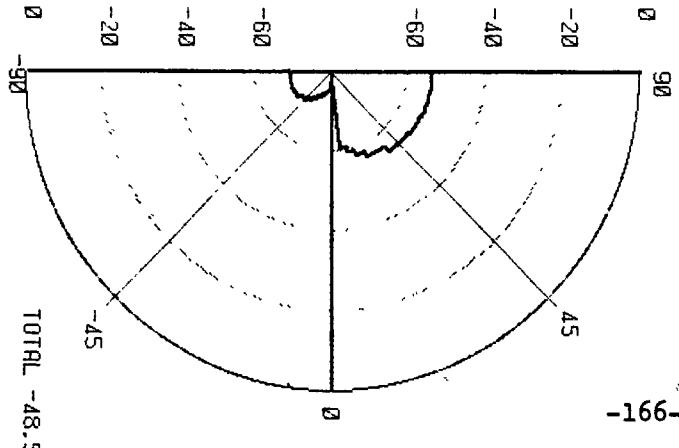
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



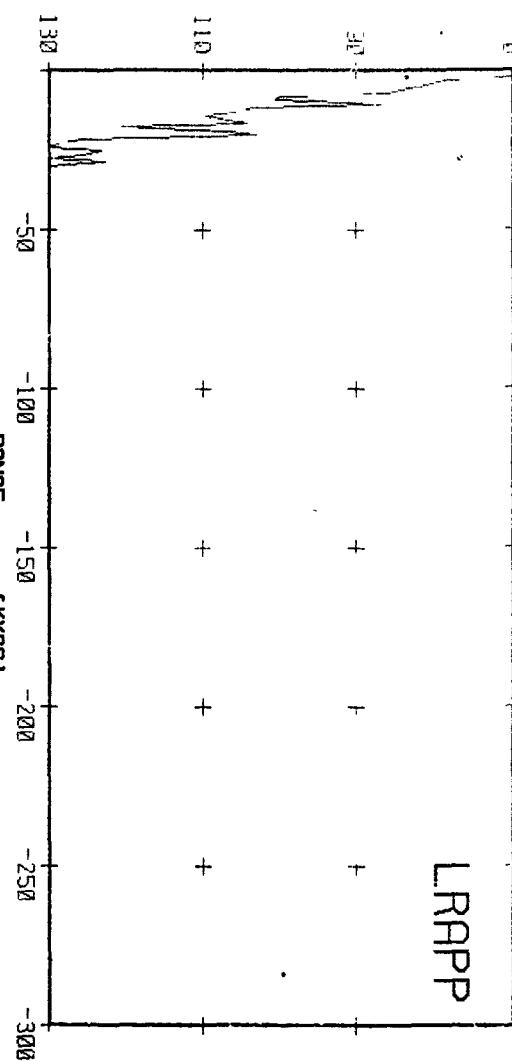
ARR 5 WINTER

S 50 R 300 F 2500

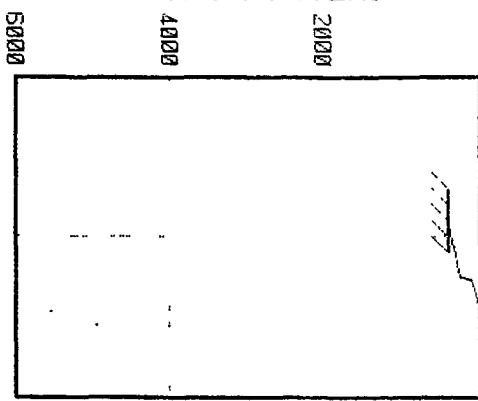
1450 M/S 1500 1550

LRAAPP

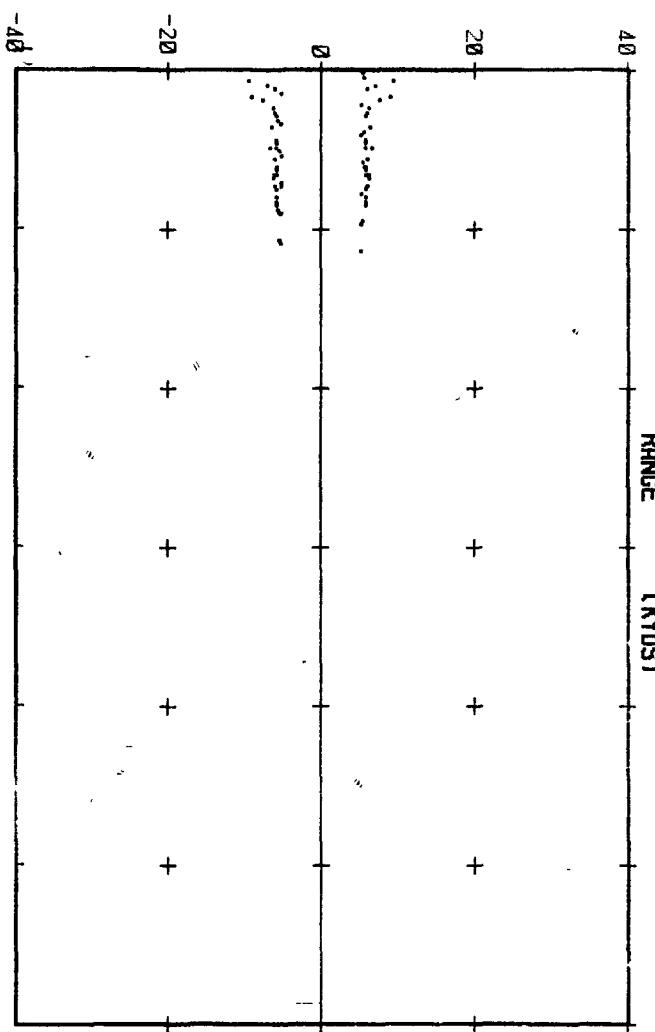
DB LOSS



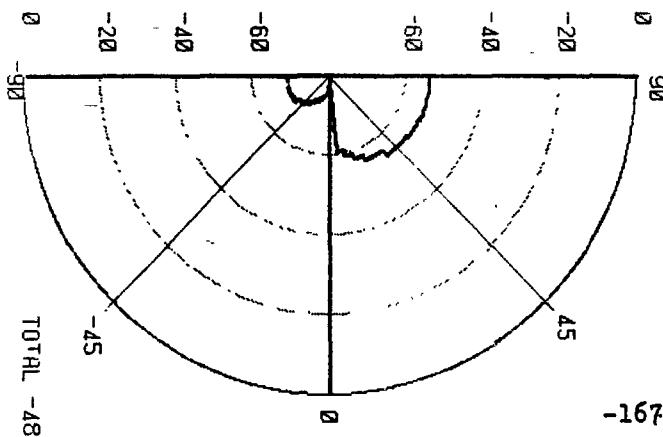
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



-167-

TOTAL -48.5 DB

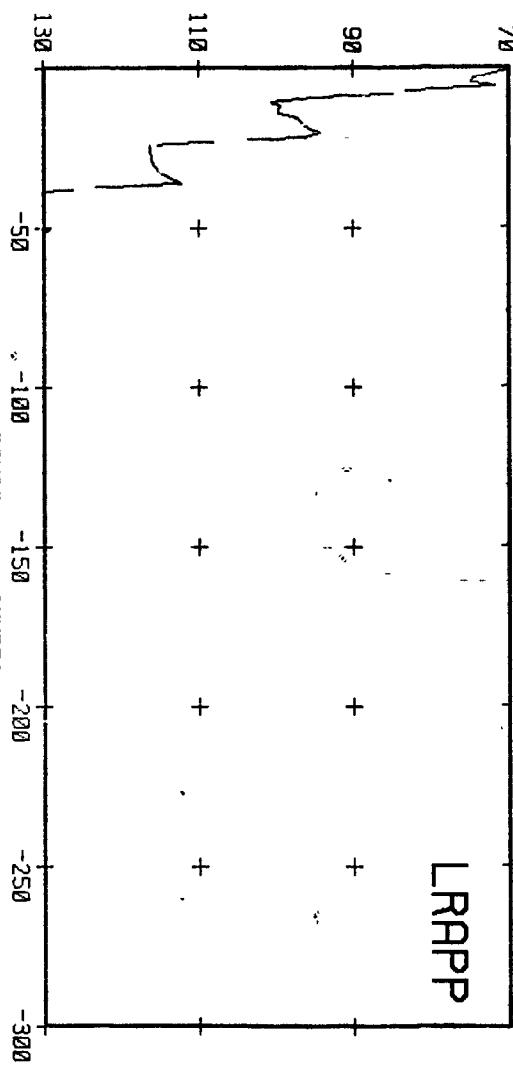
AREA 5 WINTER

S 1020 R 300 F 2500

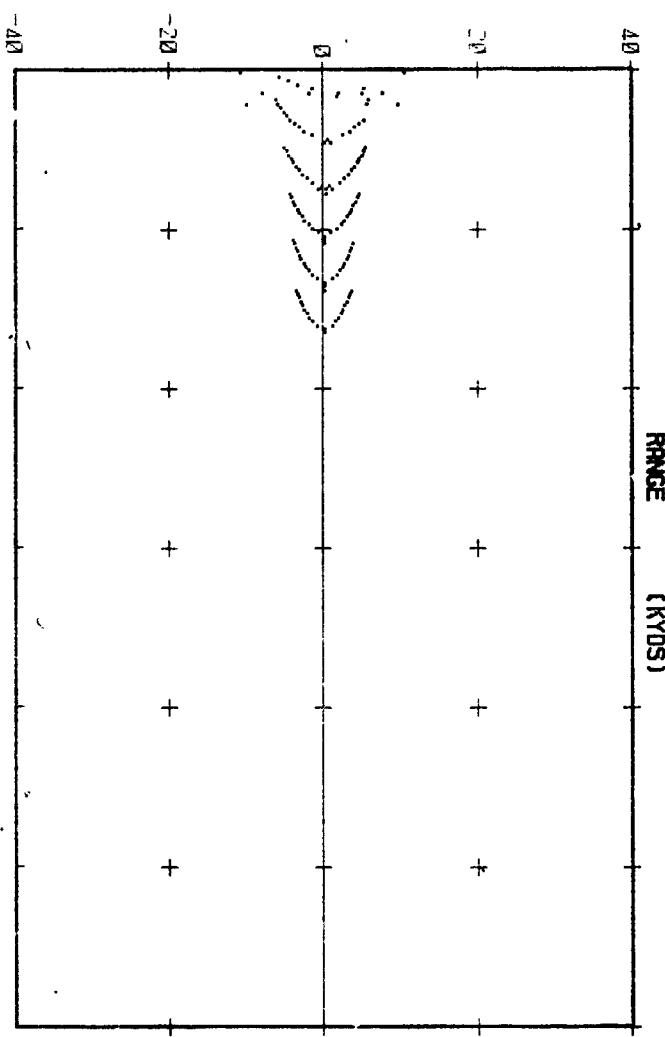
1450 M/S 1500 1550

L RAPP

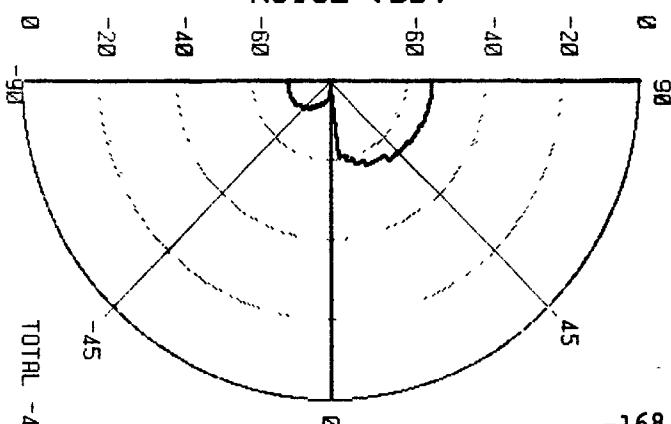
DB LOSS



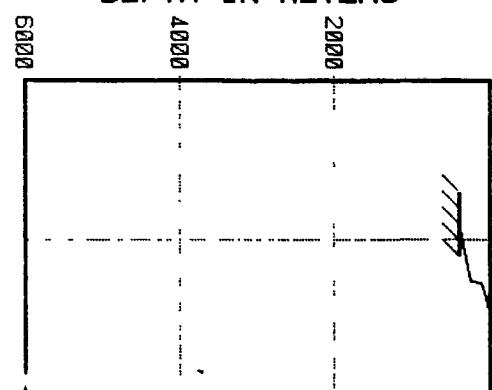
ARRIVAL ANGLE



NOISE (DB)



DEPTH IN METERS



70

AREA 5 WINTER

S 20 R 328 F 2500

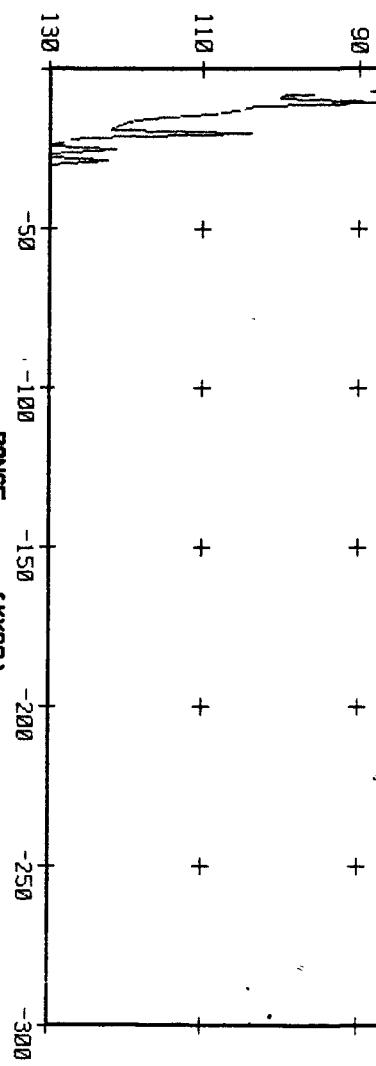
1450 M/S

1500

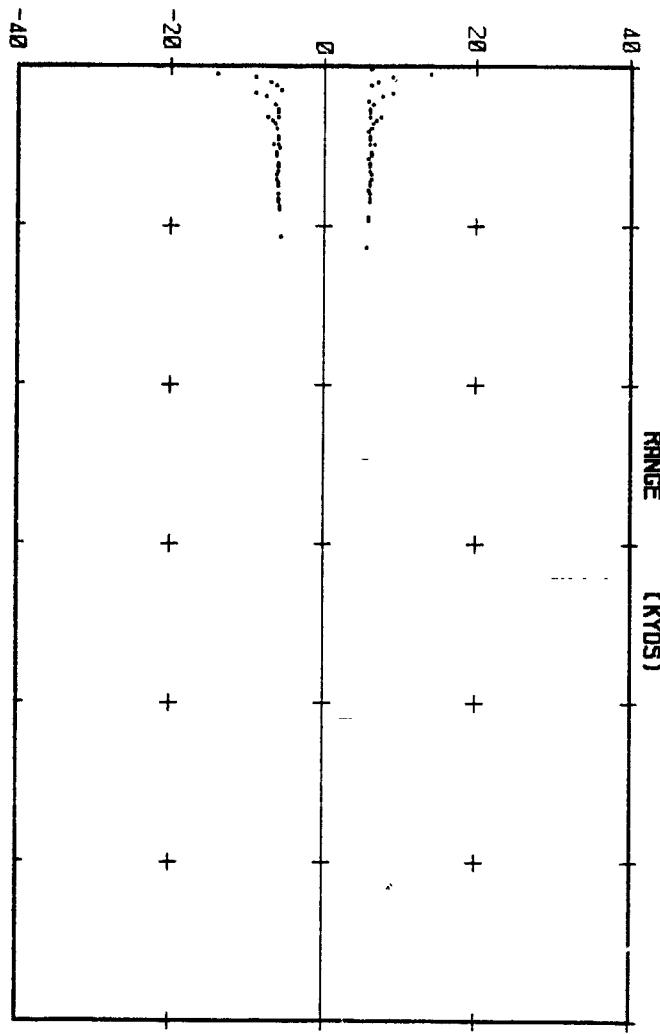
1550

LRAPP

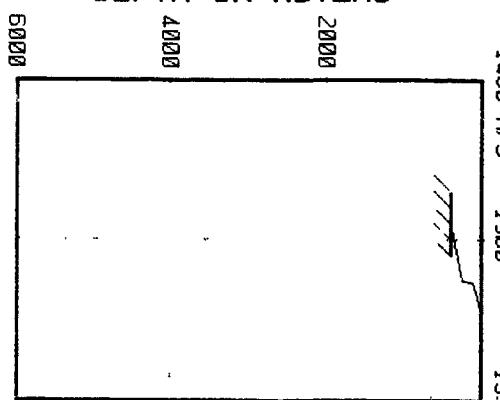
DB LOSS



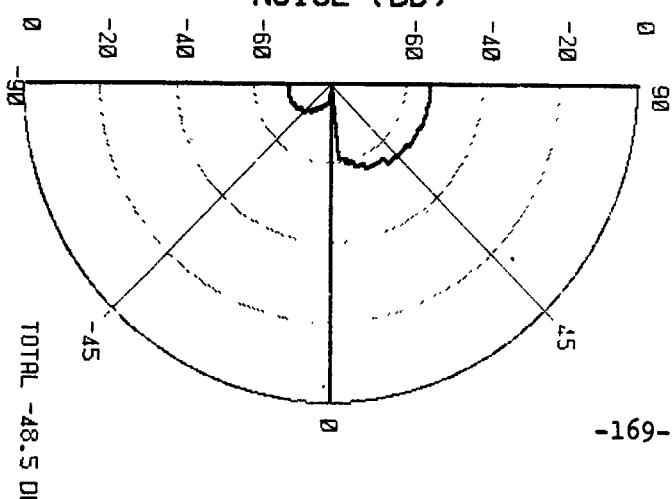
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



-169-

TOTAL -48.5 DB

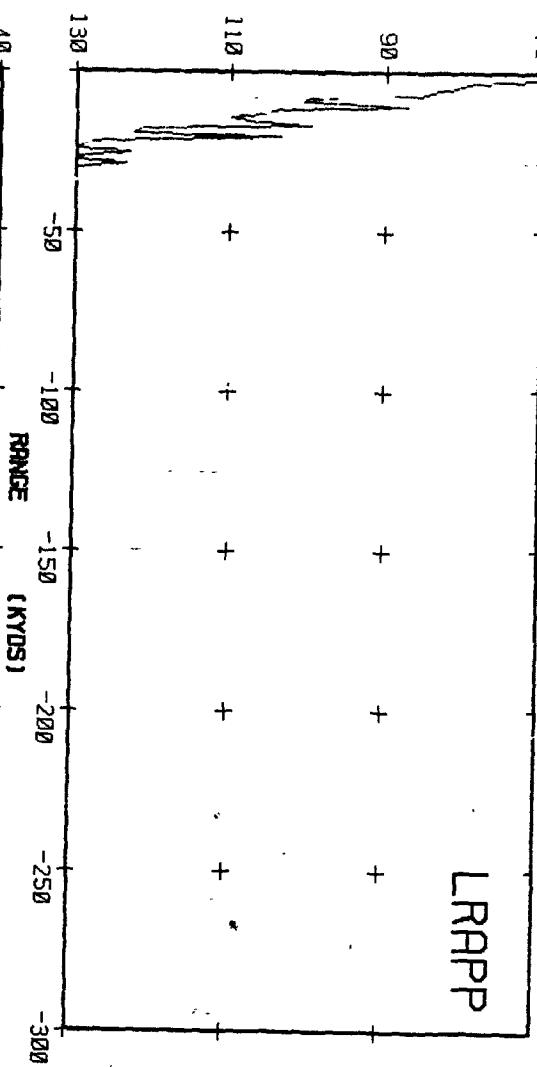
70

ARR 5 WINTER

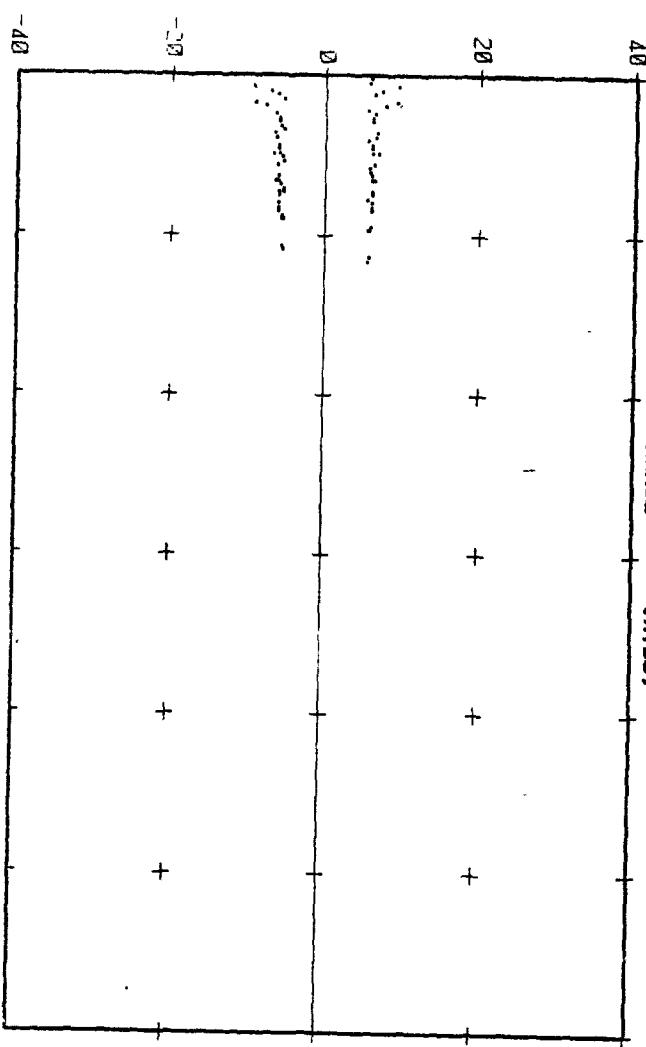
S 58 R 328 F 2500

1450 M/S 1500 1550

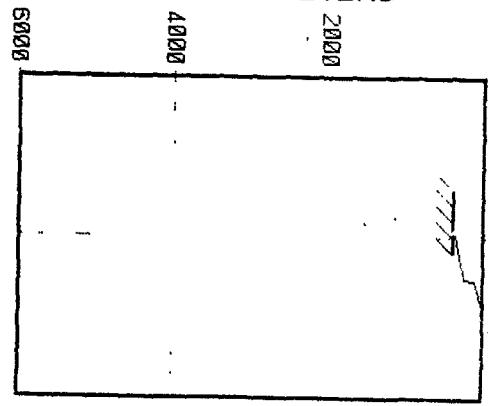
DB LOSS



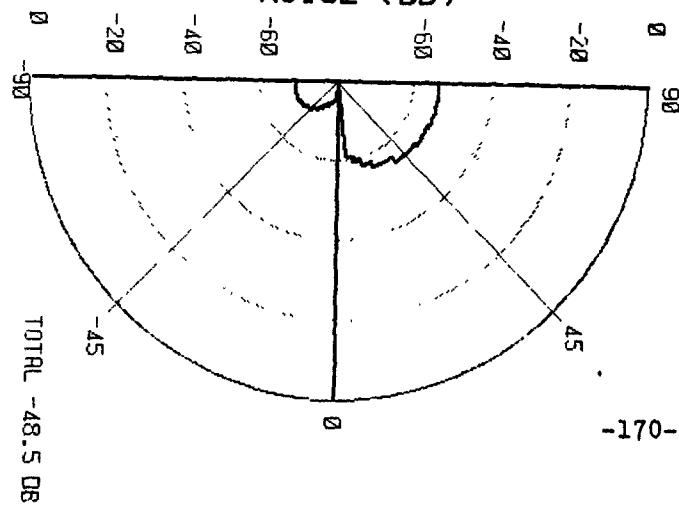
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



-170-

70

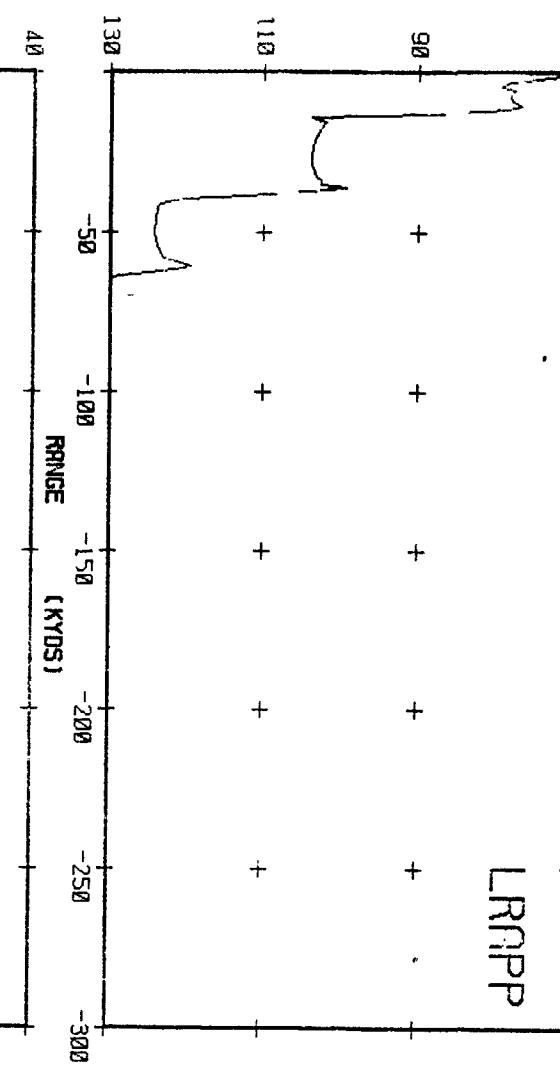
AREA 5 WINTER

S 1020 R 328 F 2500

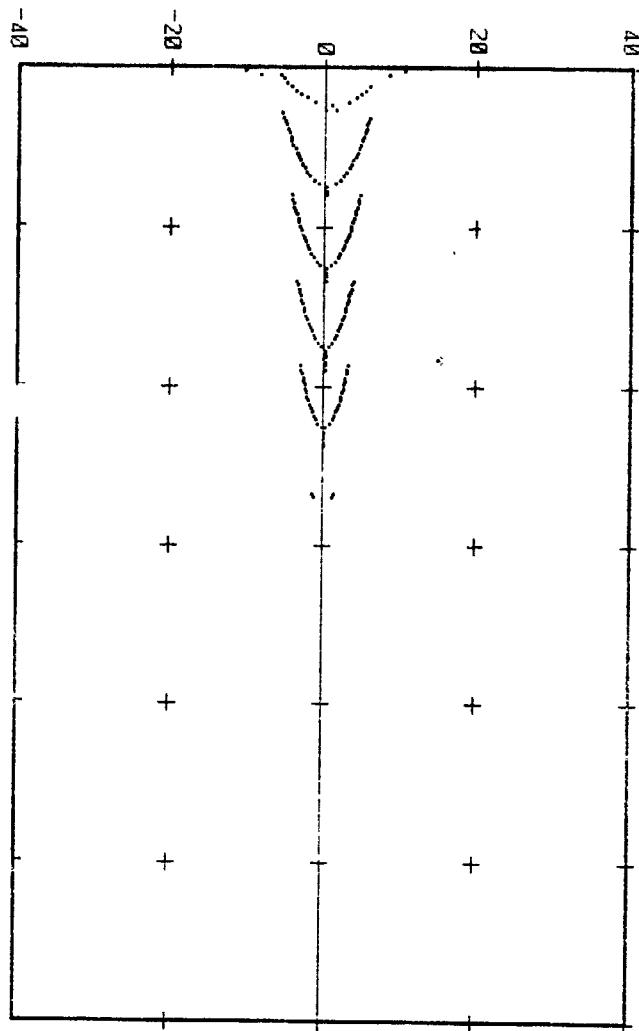
1450 M/S 1500 1550

LRAPP

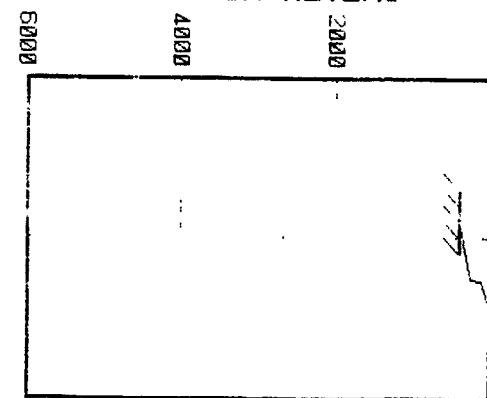
DB LOSS



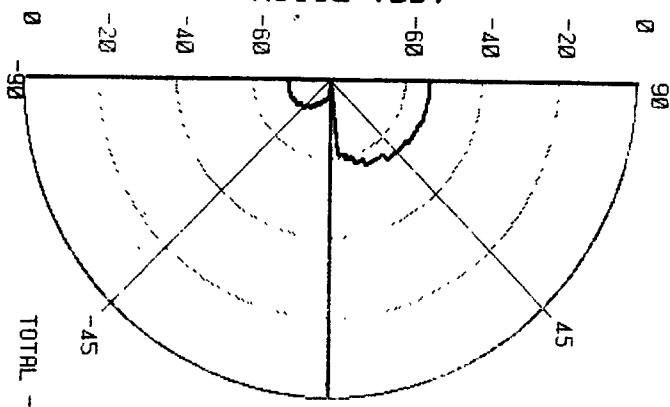
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



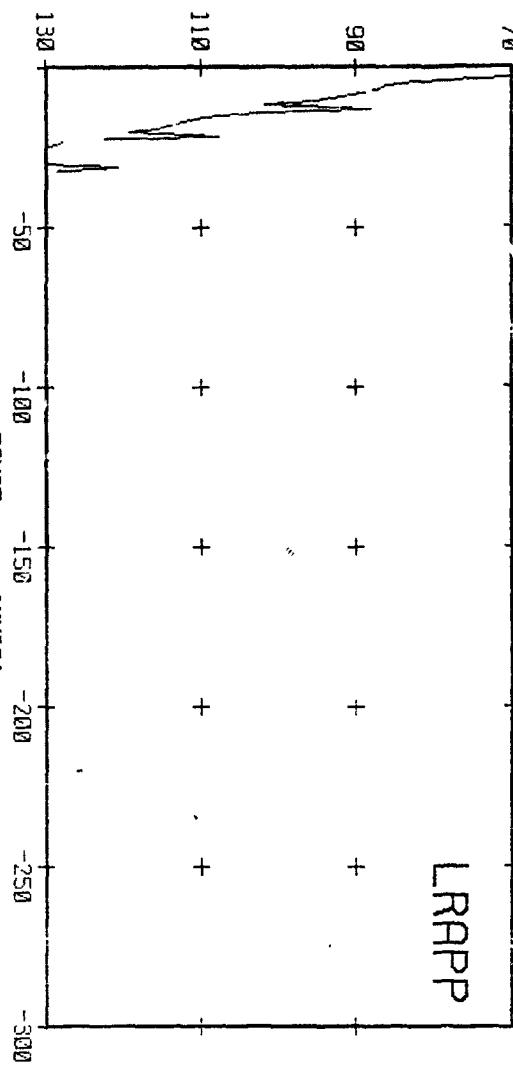
ARRP → WINTER

S 20 R 920 F 2500

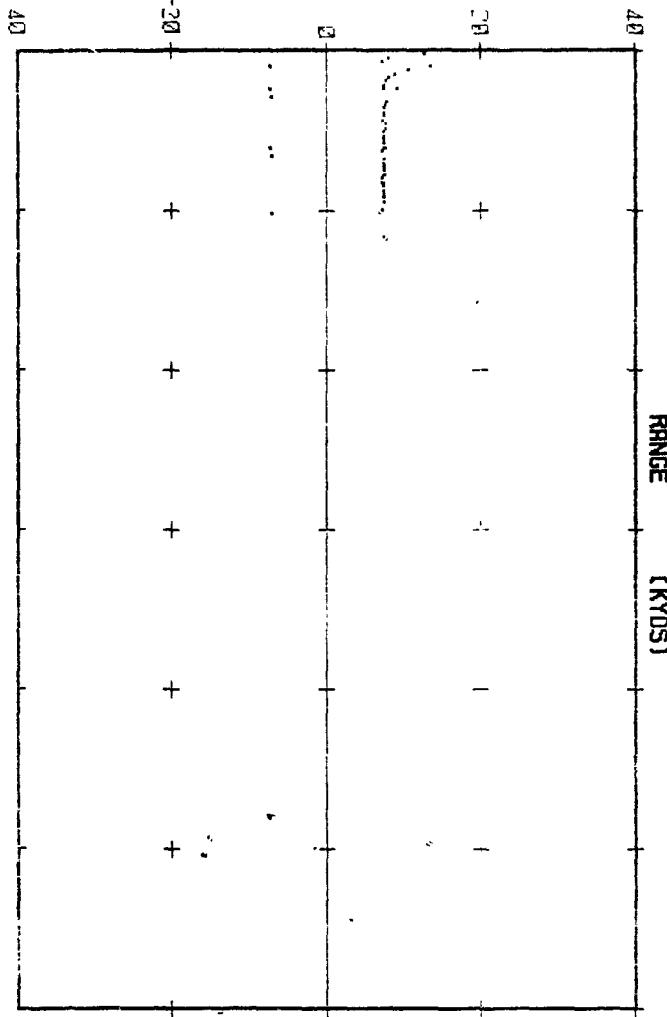
1450 M/S 1500 1550

LRAPP

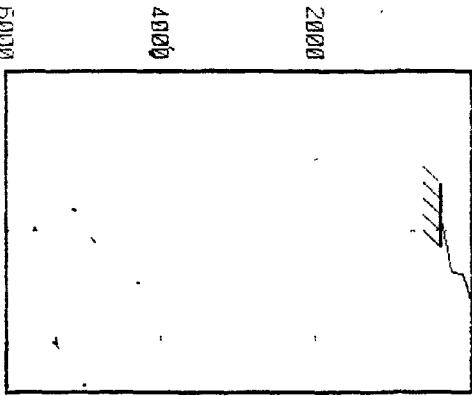
DB LOSS



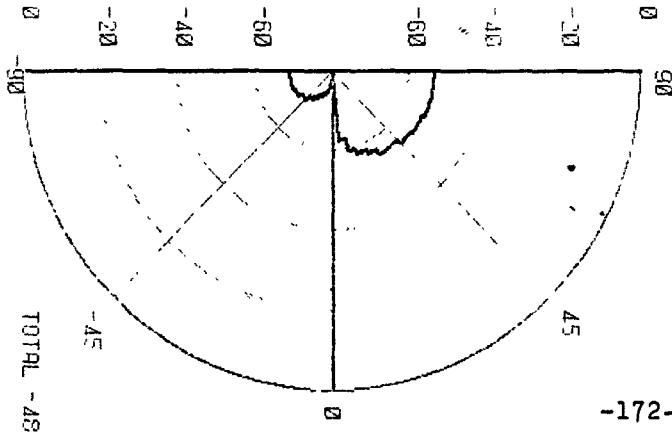
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL - 48.6 DB

70

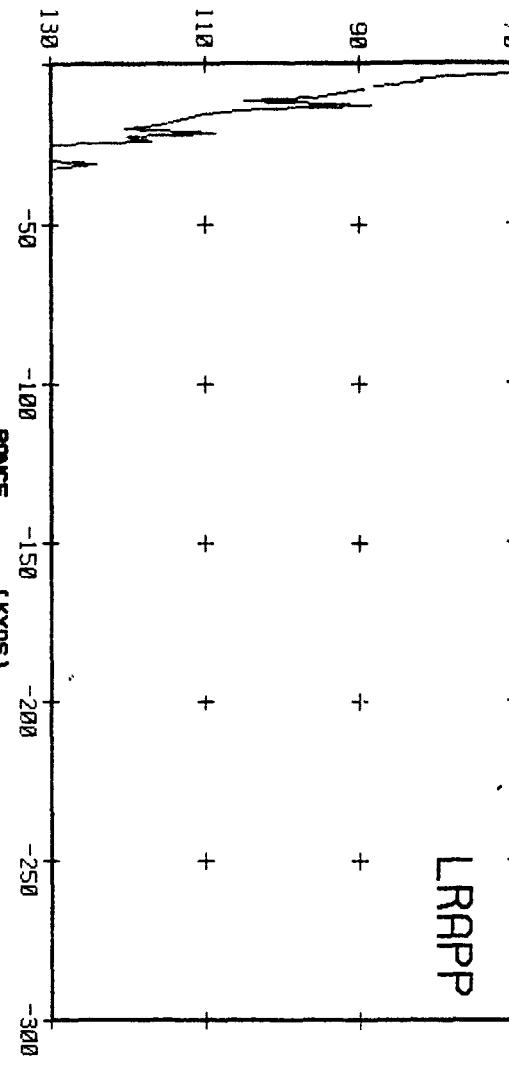
ARR 5 WINTER

S 5M R 928 F 2500

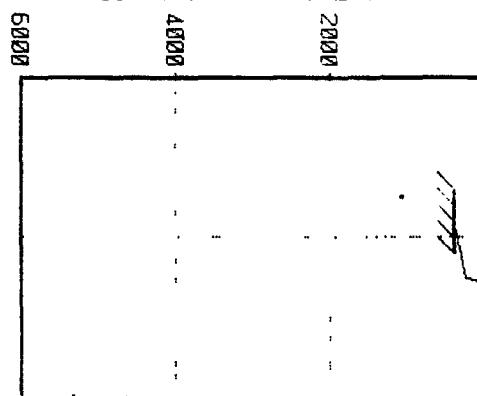
1450 M/S 1500 1550

L RAPP

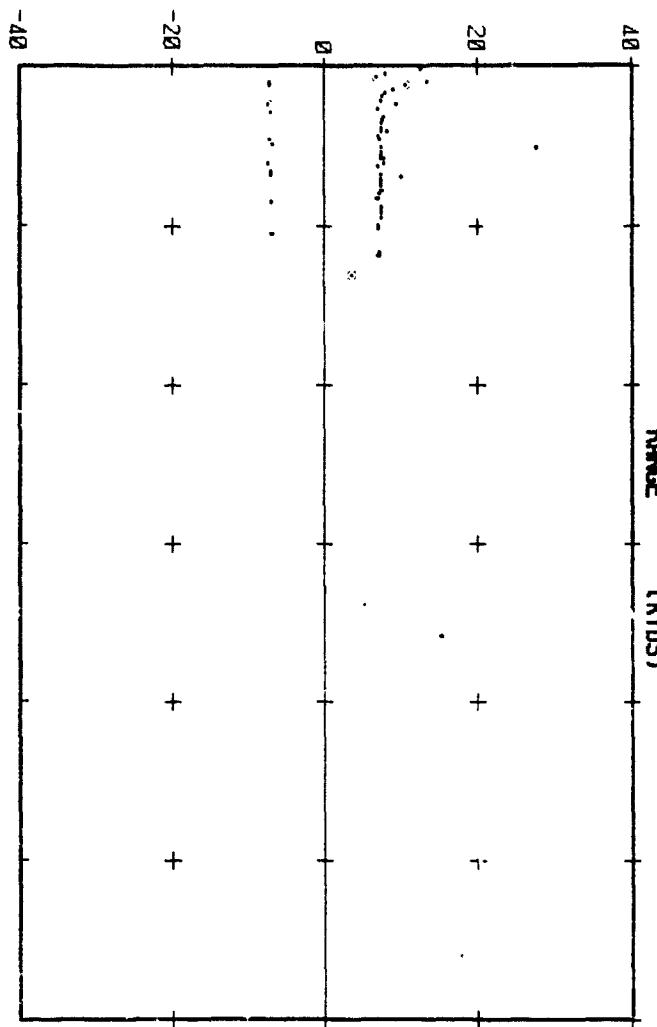
DB LOSS



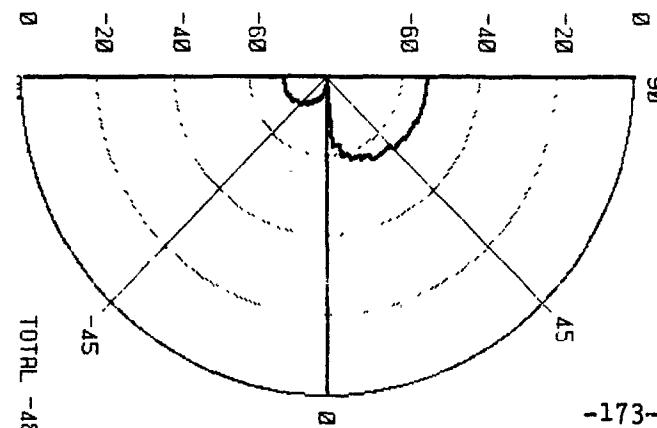
DEPTH IN METERS



ARRIVAL ANGLE



NOISE (DB)



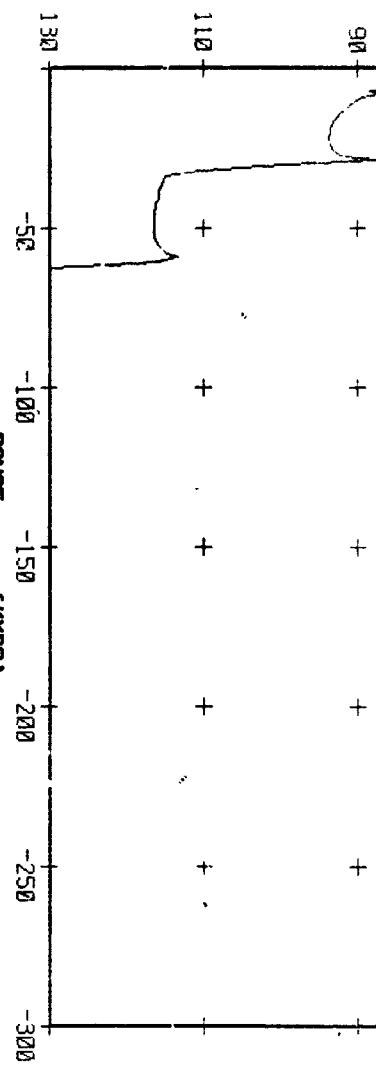
ARRER 5 WINTER

5 1020 R 920 F 2500

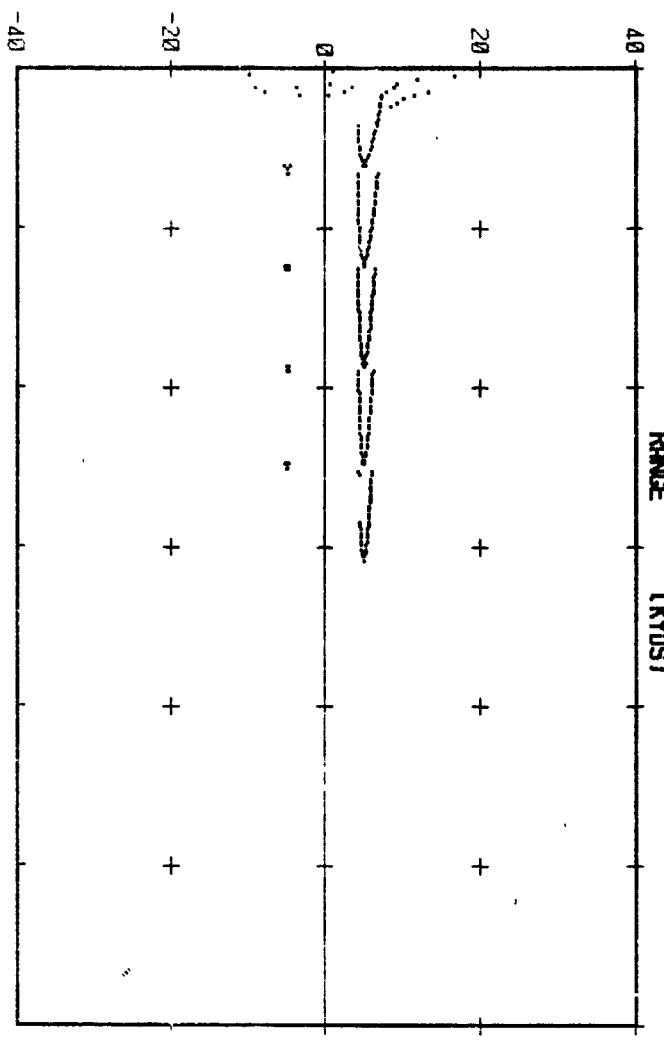
1450 M/S 1500 1550

LRAAPP

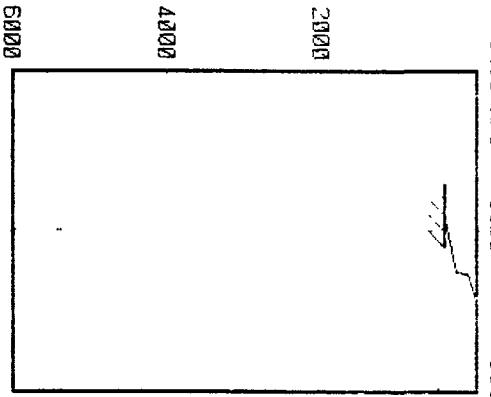
DB LOSS



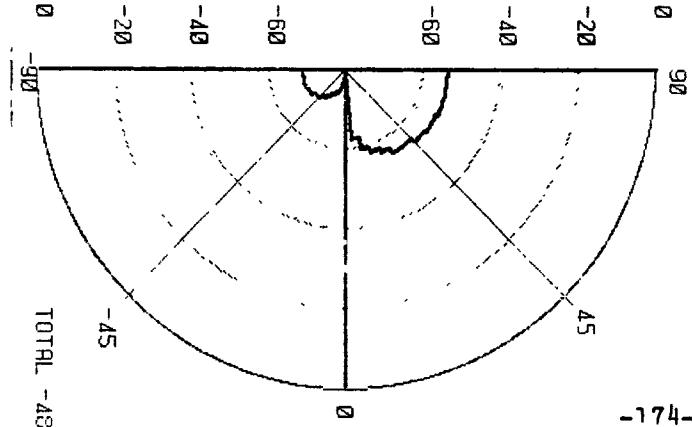
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



70

AREA 5 WINTER

S 20 R 1000 F 2500

1450 M/S 1500 1550

LRAPP

DB LOSS

90

+

+

+

+

+

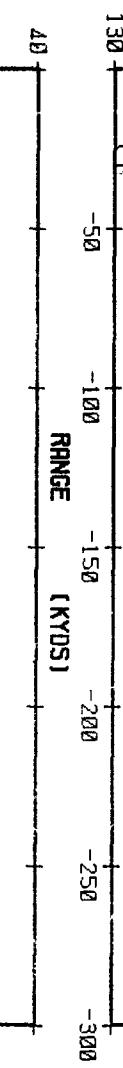
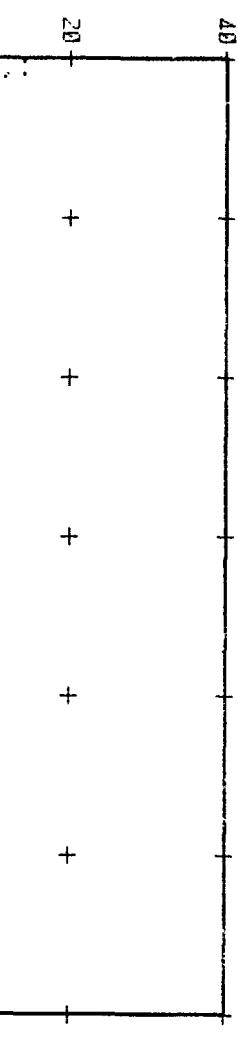
+

2000

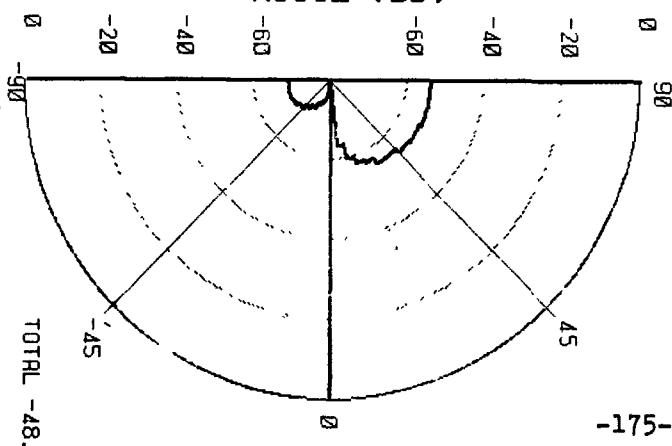
4000

6000

DEPTH IN METERS



NOISE (DB)



AREA 5 WINTER S 50.R 1000 F 2500

1450 M/S 1500 1550

LRAPP

DB LOSS

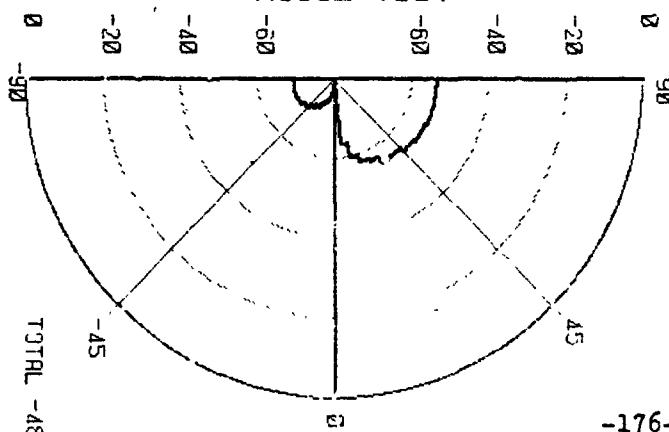
90 + + + + +
110 + + + + +
130 -50 -100 -150 -200 -250 -300

40
20
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
-200
-220
-240
-260
-280
-300

2000
4000
6000
8000
10000
12000
14000
16000
18000
20000
22000
24000
26000
28000
30000
32000
34000
36000
38000
40000
42000
44000
46000
48000
50000
52000
54000
56000
58000
60000
62000
64000
66000
68000
70000
72000
74000
76000
78000
80000
82000
84000
86000
88000
90000
92000
94000
96000
98000
100000
102000
104000
106000
108000
110000
112000
114000
116000
118000
120000
122000
124000
126000
128000
130000
132000
134000
136000
138000
140000
142000
144000
146000
148000
150000
152000
154000
156000
158000
160000
162000
164000
166000
168000
170000
172000
174000
176000
178000
180000
182000
184000
186000
188000
190000
192000
194000
196000
198000
200000
202000
204000
206000
208000
210000
212000
214000
216000
218000
220000
222000
224000
226000
228000
230000
232000
234000
236000
238000
240000
242000
244000
246000
248000
250000
252000
254000
256000
258000
260000
262000
264000
266000
268000
270000
272000
274000
276000
278000
280000
282000
284000
286000
288000
290000
292000
294000
296000
298000
300000
302000
304000
306000
308000
310000
312000
314000
316000
318000
320000
322000
324000
326000
328000
330000
332000
334000
336000
338000
340000
342000
344000
346000
348000
350000
352000
354000
356000
358000
360000
362000
364000
366000
368000
370000
372000
374000
376000
378000
380000
382000
384000
386000
388000
390000
392000
394000
396000
398000
400000
402000
404000
406000
408000
410000
412000
414000
416000
418000
420000
422000
424000
426000
428000
430000
432000
434000
436000
438000
440000
442000
444000
446000
448000
450000
452000
454000
456000
458000
460000
462000
464000
466000
468000
470000
472000
474000
476000
478000
480000
482000
484000
486000
488000
490000
492000
494000
496000
498000
500000
502000
504000
506000
508000
510000
512000
514000
516000
518000
520000
522000
524000
526000
528000
530000
532000
534000
536000
538000
540000
542000
544000
546000
548000
550000
552000
554000
556000
558000
560000
562000
564000
566000
568000
570000
572000
574000
576000
578000
580000
582000
584000
586000
588000
590000
592000
594000
596000
598000
600000
602000
604000
606000
608000
610000
612000
614000
616000
618000
620000
622000
624000
626000
628000
630000
632000
634000
636000
638000
640000
642000
644000
646000
648000
650000
652000
654000
656000
658000
660000
662000
664000
666000
668000
670000
672000
674000
676000
678000
680000
682000
684000
686000
688000
690000
692000
694000
696000
698000
700000
702000
704000
706000
708000
710000
712000
714000
716000
718000
720000
722000
724000
726000
728000
730000
732000
734000
736000
738000
740000
742000
744000
746000
748000
750000
752000
754000
756000
758000
760000
762000
764000
766000
768000
770000
772000
774000
776000
778000
780000
782000
784000
786000
788000
790000
792000
794000
796000
798000
800000
802000
804000
806000
808000
810000
812000
814000
816000
818000
820000
822000
824000
826000
828000
830000
832000
834000
836000
838000
840000
842000
844000
846000
848000
850000
852000
854000
856000
858000
860000
862000
864000
866000
868000
870000
872000
874000
876000
878000
880000
882000
884000
886000
888000
890000
892000
894000
896000
898000
900000
902000
904000
906000
908000
910000
912000
914000
916000
918000
920000
922000
924000
926000
928000
930000
932000
934000
936000
938000
940000
942000
944000
946000
948000
950000
952000
954000
956000
958000
960000
962000
964000
966000
968000
970000
972000
974000
976000
978000
980000
982000
984000
986000
988000
990000
992000
994000
996000
998000
1000000

NOISE (DB)

DEPTH IN METERS



-176-

70

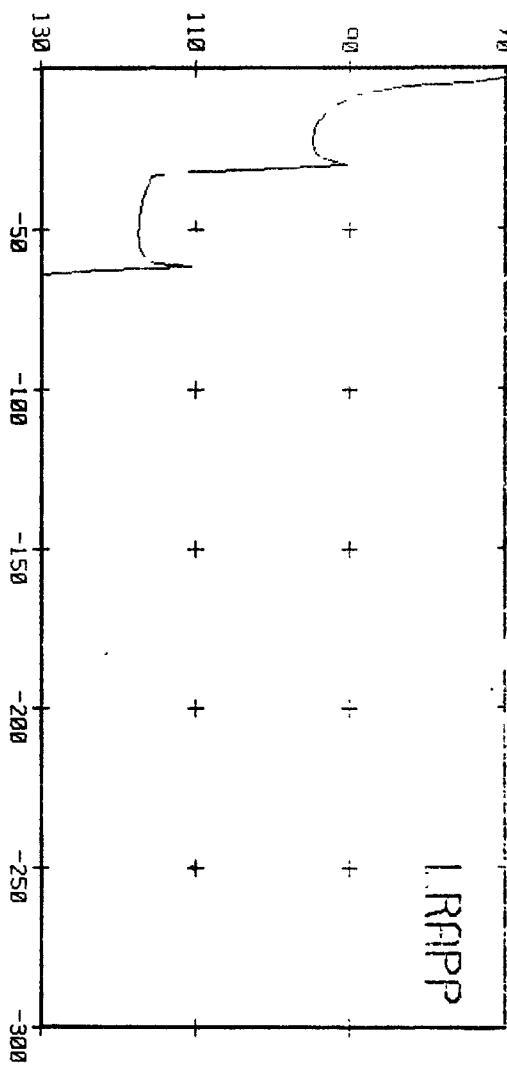
RIVER 5 WINTER

S 1020 R 1610 F 2500

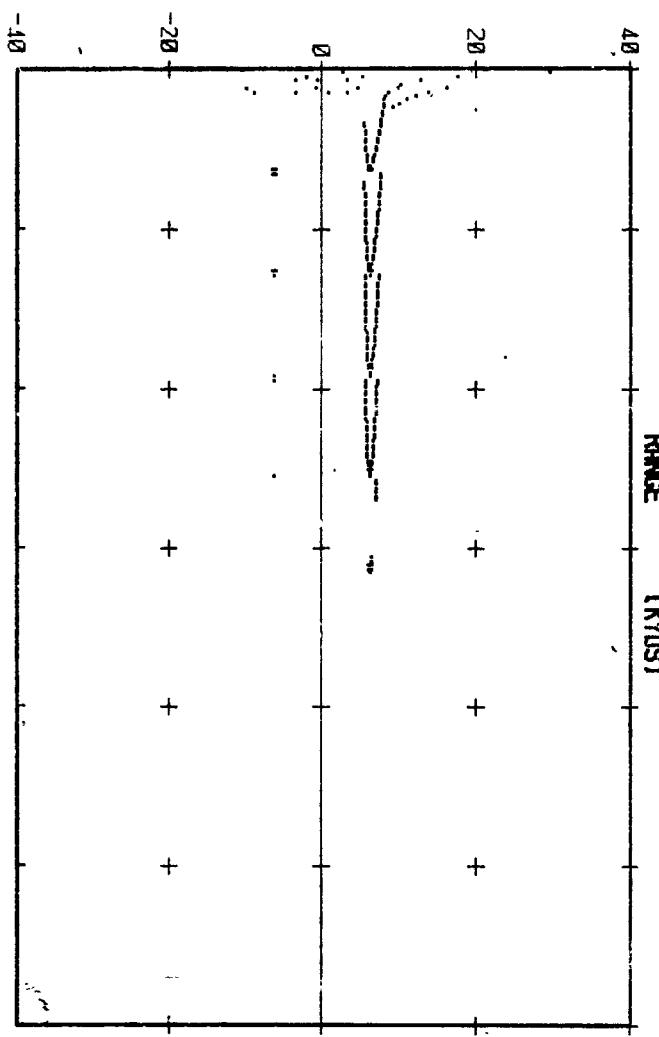
1450 M/S 1590 1550

I.R.H.P.P

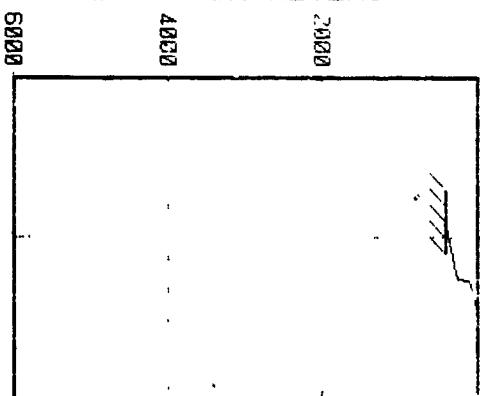
DB LOSS



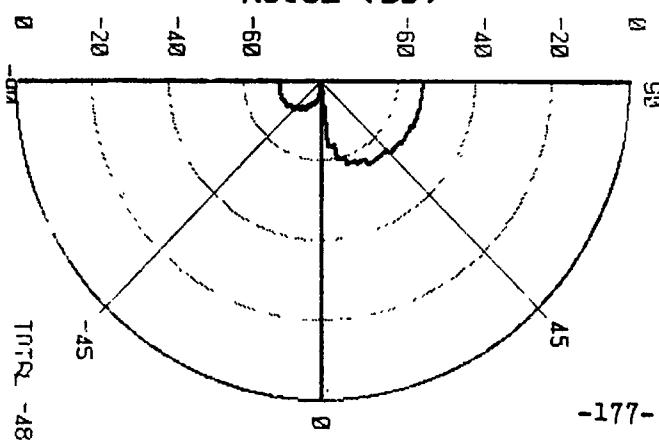
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



-177-

70

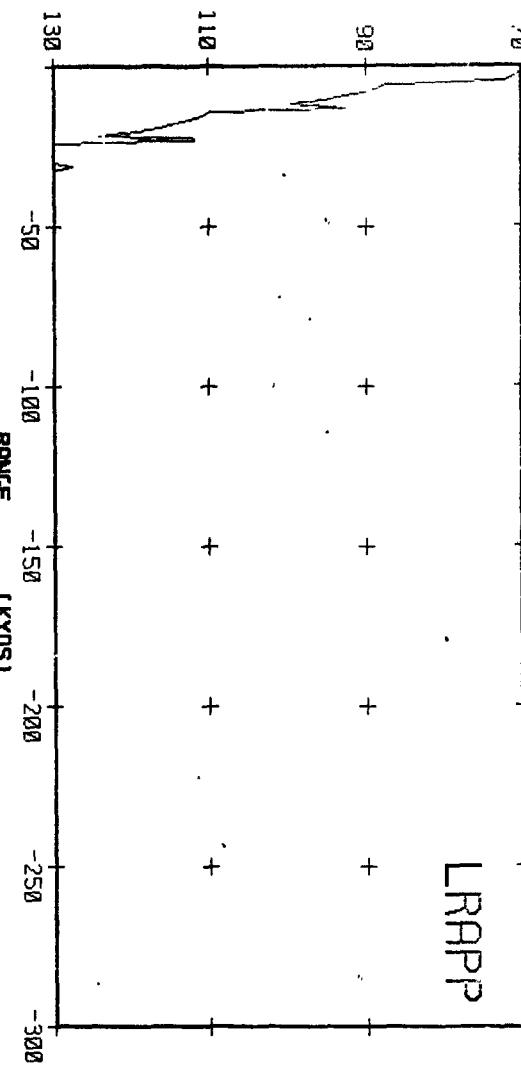
AREA 5 WINTER

S 20 R 1312 F 2500

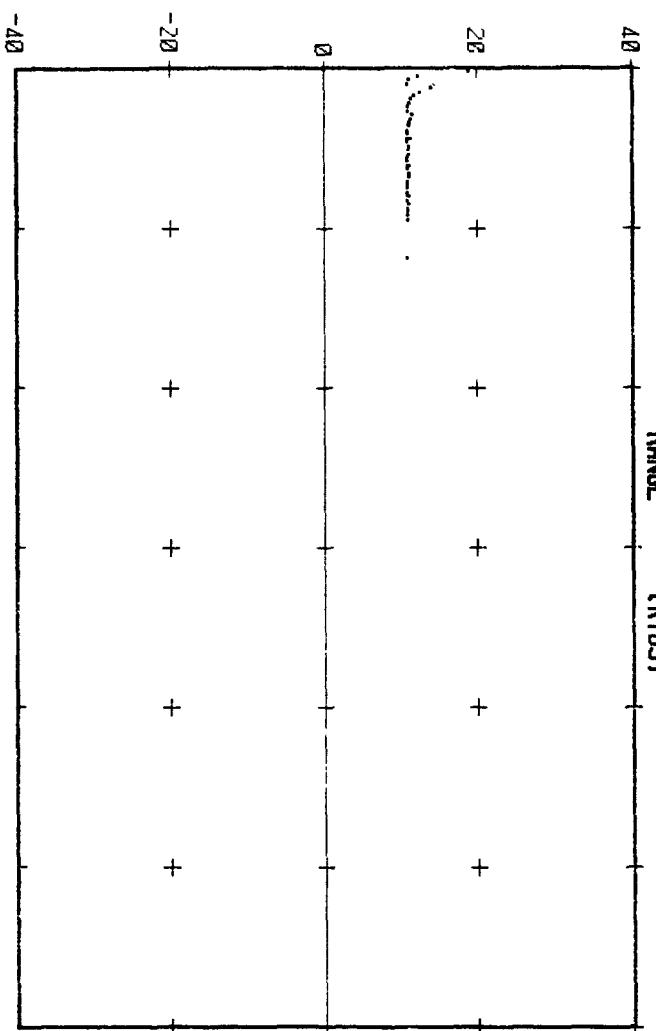
1450 M/S 1500 1550

LRAPP

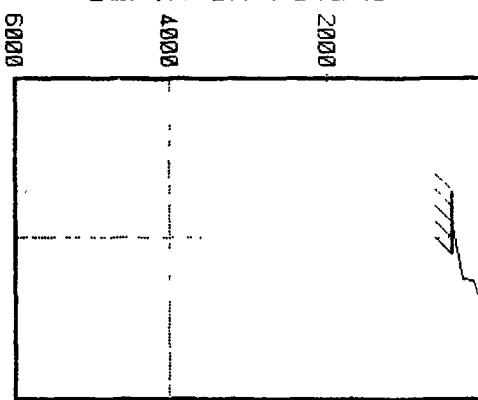
DB LOSS



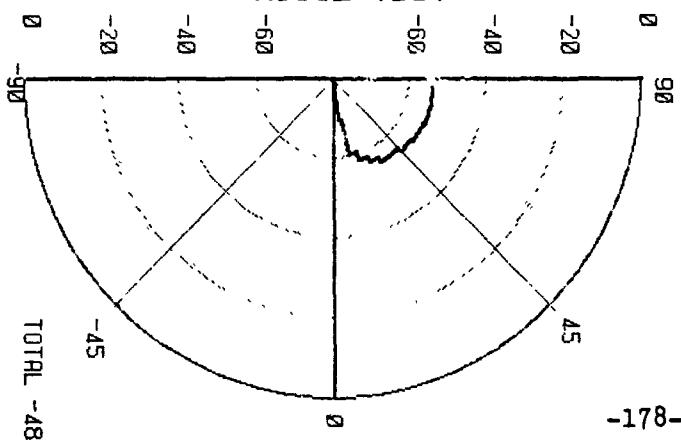
ARRIVAL ANGLE



DEPTH IN METERS



NOISE (DB)



TOTAL -48.8 dB

AREA 5 WINTER

S 50 R 1312 F 2580

1450 M/S 1500 1550

L RAPP

DB LOSS

+ + + + + + + + + +

130
110
40

RANGE (KYDS)

0
6000
4000
2000

DEPTH IN METERS

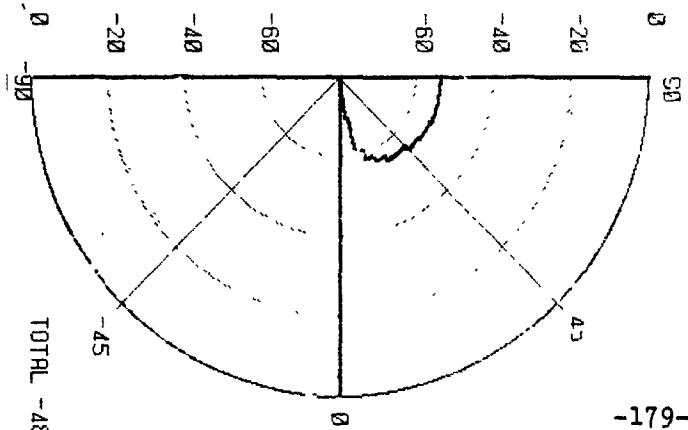
ARRIVAL ANGLE

-20
0
20
+ + + + + + + + + +

-40

0
-100
-150
-200
-250
-300

NOISE (DB)



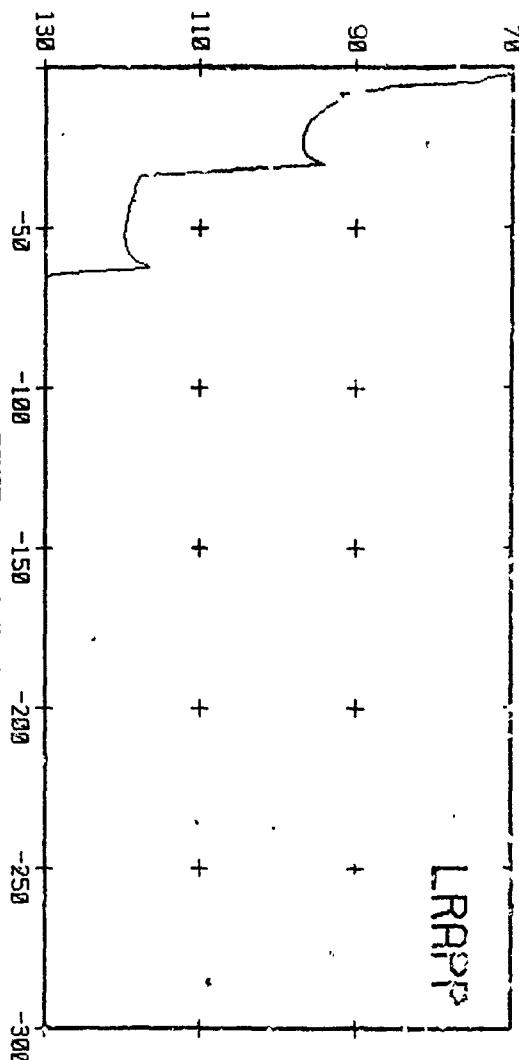
AREA 5 WINTER

S 1920 R 1312 F 2500

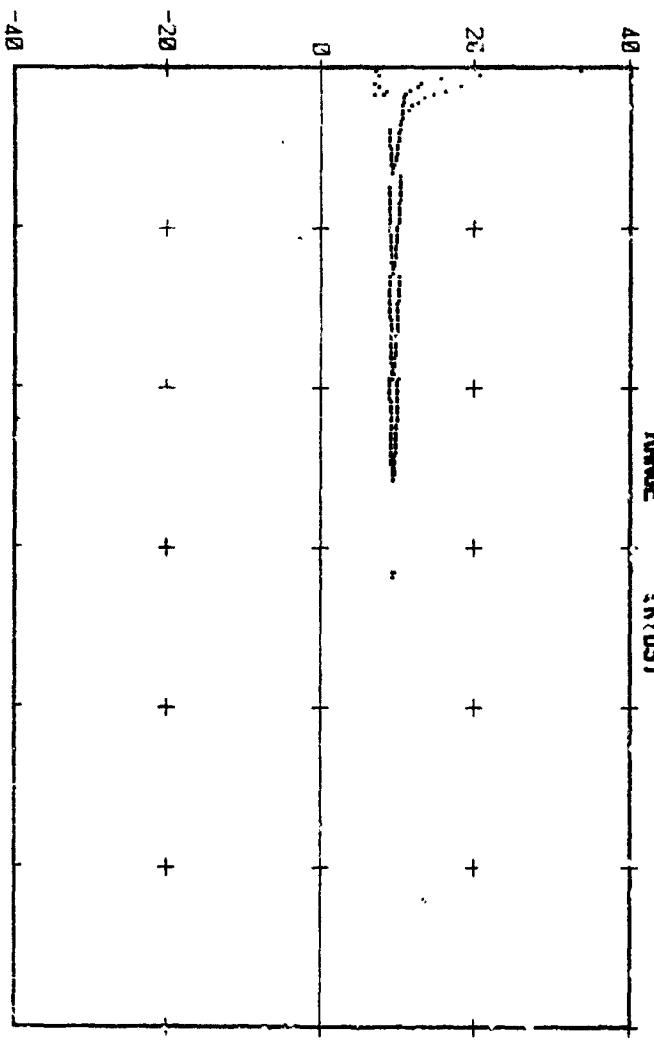
1450 M/S 1330 1550

LRRP'S

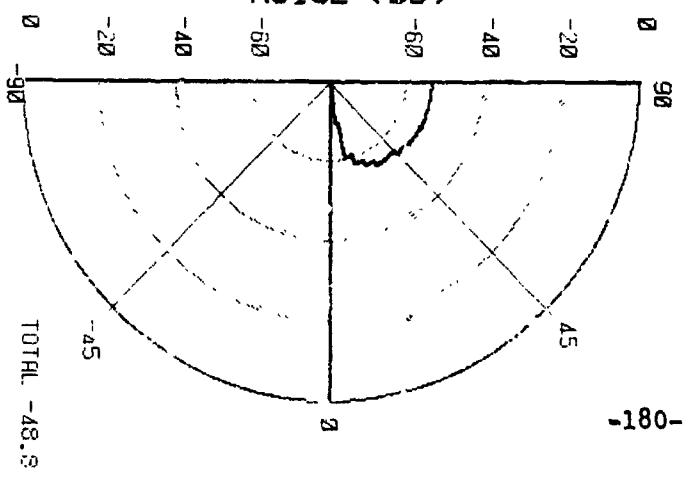
DB LOSS



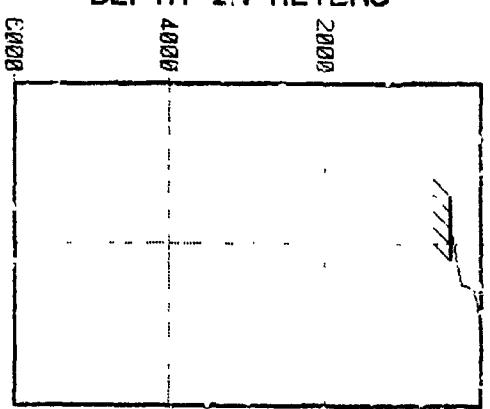
ARRIVAL ANGLE



NOISE (DB)



DEPTH IN METERS





DEPARTMENT OF THE NAVY

OFFICE OF NAVAL RESEARCH
875 NORTH RANDOLPH STREET
SUITE 1425
ARLINGTON VA 22203-1995

IN REPLY REFER TO:

5510/1
Ser 321OA/011/06
31 Jan 06

MEMORANDUM FOR DISTRIBUTION LIST

Subj: DECLASSIFICATION OF LONG RANGE ACOUSTIC PROPAGATION PROJECT (LRAPP) DOCUMENTS

Ref: (a) SECNAVINST 5510.36

Encl: (1) List of DECLASSIFIED LRAPP Documents

1. In accordance with reference (a), a declassification review has been conducted on a number of classified LRAPP documents.
2. The LRAPP documents listed in enclosure (1) have been downgraded to UNCLASSIFIED and have been approved for public release. These documents should be remarked as follows:

Classification changed to UNCLASSIFIED by authority of the Chief of Naval Operations (N772) letter N772A/6U875630, 20 January 2006.

DISTRIBUTION STATEMENT A: Approved for Public Release; Distribution is unlimited.

3. Questions may be directed to the undersigned on (703) 696-4619, DSN 426-4619.

BRIAN LINK
By direction

Subj: DECLASSIFICATION OF LONG RANGE ACOUSTIC PROPAGATION PROJECT
(LRAPP) DOCUMENTS

DISTRIBUTION LIST:

NAVOCEANO (Code N121LC – Jaime Ratliff)
NRL Washington (Code 5596.3 – Mary Templeman)
PEO LMW Det San Diego (PMS 181)
DTIC-OCQ (Larry Downing)
ARL, U of Texas
Blue Sea Corporation (Dr. Roy Gaul)
ONR 32B (CAPT Paul Stewart)
ONR 321OA (Dr. Ellen Livingston)
APL, U of Washington
APL, Johns Hopkins University
ARL, Penn State University
MPL of Scripps Institution of Oceanography
WHOI
NAVSEA
NAVAIR
NUWC
SAIC

Declassified LRAPP Documents

Report Number	Personal Author	Title	Publication Source (Originator)	Pub. Date	Current Availability	Class.
Unavailable	Unavailable	ACOUSTIC ENVIRONMENTAL SCENARIOS AND PREDICTIONS FOR ASW. VOLUME VII. AREA 3A SUMMER PREDICTIONS FOR PASSIVE SONAR	Maury Center for Ocean Science	721001	AD0910342	U
Unavailable	Unavailable	ACOUSTIC ENVIRONMENTAL SCENARIOS AND PREDICTIONS FOR ASW. VOLUME VIII. AREA 3B WINTER PREDICTIONS FOR PASSIVE SONAR	Maury Center for Ocean Science	721001	AD0910343	U
Unavailable	Unavailable	ACOUSTIC ENVIRONMENTAL SCENARIOS AND PREDICTIONS FOR ASW. VOLUME IX. AREA 3B SUMMER PREDICTIONS FOR PASSIVE SONAR	Maury Center for Ocean Science	721001	AD0910344	U
Unavailable	Unavailable	ACOUSTIC ENVIRONMENTAL SCENARIOS AND PREDICTIONS FOR ASW. VOLUME V. AREA 2 SUMMER PREDICTIONS FOR PASSIVE SONAR	Maury Center for Ocean Science	721001	AD0911224	U
Unavailable	Unavailable	ACOUSTIC ENVIRONMENTAL SCENARIOS AND PREDICTIONS FOR ASW. VOLUME XI. AREA 4A SUMMER PREDICTIONS FOR PASSIVE SONAR	Maury Center for Ocean Science	721001	AD0912560	U
Unavailable	Unavailable	ACOUSTIC ENVIRONMENTAL SCENARIOS AND PREDICTIONS FOR ASW. VOLUME X. AREA 4A WINTER PREDICTIONS FOR PASSIVE SONAR	Maury Center for Ocean Science	721001	AD0916556	U
MC-011 VOL. 14	Unavailable	ACOUSTIC ENVIRONMENTAL SCENARIOS AND PREDICTIONS FOR ASW. VOLUME XIV. AREA 5 WINTER PREDICTIONS FOR PASSIVE SONAR	Maury Center for Ocean Science	721001	AD0916557; ND	U
MC-011 VOL. 13	Unavailable	ACOUSTIC ENVIRONMENTAL SCENARIOS AND PREDICTIONS FOR ASW. VOLUME XIII. AREA 4B SUMMER PREDICTIONS FOR PASSIVE SONAR	Maury Center for Ocean Science	721001	AD0916610; ND	U
MCR008	Goodman, R. R., et al.	THE NEAT 1 EXPERIMENT (U)	Maury Center for Ocean Science	721001	NS; ND	U
Unavailable	Cherry, W. R.	LRAPP BEAMFORMER	Scripps Institution of Oceanography Marine Physical Laboratory	721015	ADA081876	U
ONR ACR-186	Gregory, J. B.	PROJECT LRAPP TEST BED- TECHNOLOGY USED IN THE DEVELOPMENT OF A DEEP-OCEAN STABLE PLATFORM (U)	Office of Naval Research	721024	AD0915237C, ND	U
MC-010	Unavailable	CHURCH GABBRO EXERCISE PLAN- LRAPP (U)	Maury Center for Ocean Science	721026	ND	U
WHOI-72-87	Daubin, S. C., et al.	THE ACODAC SYSTEM	Woods Hole Oceanographic Institution	721101	AD0756628; ND	U
NRLR7516	Fleming, H. S., et al.	PROJECT NEAT 1 ENVIRONMENTAL DATA REPORT (U) (USNS J.W. GIBBS)	Naval Research Laboratory	721129	AD NS 22746	U